



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

**ENHANCING DECISION MAKING DURING INITIAL
OPERATIONS AT SURGE EVENTS**

by

Brian P. Duggan

December 2012

Thesis Co-Advisors:

Susan Hocevar
John Rollins

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 2012	3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE ENHANCING DECISION MAKING DURING INITIAL OPERATIONS AT SURGE EVENTS			5. FUNDING NUMBERS	
6. AUTHOR(S) Brian P. Duggan				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number <u>NPS.2012.0038-IR-EP7-A</u> .				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE A	
13. ABSTRACT (maximum 200 words) This thesis utilized a Delphi survey method to obtain the perspective of seasoned Incident Commanders (ICs), as they reflected on their experience responding to surge incidents. Surge events are defined as complex and chaotic emergencies that require resources well beyond normal operating capacity. These surge events are rare and of such a magnitude that the Incident Commander is confronted with a unique situation that often exceeds his/her experience and ability to improvise and adapt to changing conditions. This thesis combines the pertinent literature on decision making, situational awareness, collaboration and geospatial technology with the lens of experience provided by the Delphi panel. First, this research identifies and prioritizes 18 signals that an incident is becoming nonroutine, unfamiliar and chaotic. Second, it provides an inventory of strategic options that an Incident Commander can consider when faced with the chaos that often accompanies a surge event. Finally, this material was synthesized into a quick action guide as a reference source that can inform Incident Commanders, as they face the dynamic and unpredictable environment of surge events. The knowledge obtained through this research is offered with the desire to enhance the ability of Incident Commanders to make effective decisions when lives are most at risk.				
14. SUBJECT TERMS Surge incidents, decision making, Delphi, chaotic context, collaboration, situational awareness, geospatial technology, Massachusetts, incident command, satisficing, incident management team, barriers, command structure, disorder, expert, novice, symptoms, signals, patterns, cues, complex context, strategies			15. NUMBER OF PAGES 309	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

**ENHANCING DECISION MAKING DURING INITIAL OPERATIONS AT SURGE
EVENTS**

Brian P. Duggan
Fire Chief/Emergency Manager, City of Northampton, Massachusetts
B.S., Providence College, 1981
MBA, Nichols College, 1995

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)**

from the

**NAVAL POSTGRADUATE SCHOOL
December 2012**

Author: Brian P. Duggan

Approved by: Susan Hocevar
Thesis Co-Advisor

John Rollins
Thesis Co-Advisor

Daniel Moran
Chair, Department of National Security Affairs

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

This thesis utilized a Delphi survey method to obtain the perspective of seasoned Incident Commanders (ICs), as they reflected on their experience responding to surge incidents. Surge events are defined as complex and chaotic emergencies that require resources well beyond normal operating capacity. These surge events are rare and of such a magnitude that the Incident Commander is confronted with a unique situation that often exceeds his/her experience and ability to improvise and adapt to changing conditions.

This thesis combines the pertinent literature on decision making, situational awareness, collaboration and geospatial technology with the lens of experience provided by the Delphi panel. First, this research identifies and prioritizes 18 signals that an incident is becoming nonroutine, unfamiliar and chaotic. Second, it provides an inventory of strategic options that an Incident Commander can consider when faced with the chaos that often accompanies a surge event. Finally, this material was synthesized into a quick action guide as a reference source that can inform Incident Commanders, as they face the dynamic and unpredictable environment of surge events. The knowledge obtained through this research is offered with the desire to enhance the ability of Incident Commanders to make effective decisions when lives are most at risk.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	PROBLEM STATEMENT.....	1
B.	PURPOSE OF THIS STUDY.....	5
C.	RESEARCH QUESTIONS AND METHODOLOGY.....	5
D.	ORGANIZATION OF THIS THESIS.....	6
II.	LITERATURE REVIEW	7
A.	COMMAND DECISION MAKING.....	7
B.	AGILITY AND DISCIPLINE	16
C.	SITUATIONAL AWARENESS	17
D.	COLLABORATION	21
E.	GEOSPATIAL TECHNOLOGY	23
F.	CONCLUSION	26
III.	CONSIDERING THE GERMAN PERSPECTIVE TO INCIDENT MANAGEMENT	29
A.	INTRODUCTION.....	29
B.	INCIDENT MANAGEMENT	31
C.	CONCLUSION	42
IV.	METHODS AND RESULTS—DELPHI ROUND ONE SURVEY.....	45
A.	INTRODUCTION.....	45
B.	DELPHI METHOD.....	46
C.	DEMOGRAPHICS AND SELECTION CRITERIA.....	47
D.	DELPHI SURVEY ROUND ONE: INSTRUMENTATION	48
E.	DELPHI SURVEY ROUND ONE: RESULTS.....	49
F.	SAMPLE DEMOGRAPHICS.....	50
	1. Years of Fire Service Experience	50
	2. Years of Experience as a Command Officer.....	50
	3. Command Position Most Frequently Held.....	51
G.	SIGNS, SYMPTOMS AND IDENTIFICATION OF CHAOTIC INCIDENTS.....	52
	1. Fireground / Emergency Scene Activity	60
	2. Incident Progression	61
	3. Personal Decision Making	62
	4. Other Signals	63
H.	THE ABSENCE OF SIGNALS.....	64
	1. Expected Signals That Were Not Present.....	64
	2. Reaction to the Absence of Signals.....	65
I.	DECISION-MAKING METHODOLOGY	66
	1. Altered Decision making as Incidents Become Unpredictable.....	66
J.	CONCLUSION	68

V.	METHODS AND RESULTS—DELPHI ROUND TWO SURVEY	71
A.	DEMOGRAPHICS AND SELECTION CRITERIA.....	71
B.	DELPHI SURVEY ROUND TWO: INSTRUMENTATION	71
C.	DELPHI SURVEY ROUND TWO: RESULTS	74
D.	STRATEGIES TO ENHANCE RESPONSE	74
	1. Strategies to Get Ahead of the Event and Address a Lack of Resources.....	74
	2. Regional Strategies to Complement the Initial Response..	76
E.	INFORMATION MANAGEMENT	78
	1. Strategies to Avoid Becoming Overwhelmed by Incident Related Information	78
F.	RANKING THE IMPORTANCE OF SIGNALS INDICATING AN EMERGENT EVENT	81
G.	DECISION AIDS.....	84
	1. Decision Aid and Tool to Build Confidence and Capacity .	84
H.	INCIDENT MANAGEMENT SYSTEM EVALUATION.....	85
	1. NIMS as an Optimal Model	85
	2. Responses Supporting NIMS ICS as the Optimal Model....	86
	3. Responses Suggesting That NIMS ICS is not the Optimal Model	87
	4. Improvisation to Adapt NIMS.....	87
I.	CONCLUSION	88
VI.	METHODS AND RESULTS—DELPHI ROUND THREE SURVEY	91
A.	DEMOGRAPHICS AND SELECTION CRITERIA.....	91
B.	DELPHI SURVEY ROUND THREE: INSTRUMENTATION.....	91
C.	DELPHI SURVEY ROUND THREE: RESULTS	94
D.	EFFECTIVENESS OF MUTUAL AID.....	94
	1. Improving the Second and Third Tier of Mutual Aid Response.....	94
E.	COMMAND STRATEGIES	96
	1. Frequency of Use and Potential Adoption of Strategies Utilized During Routine Command Operations.....	96
	2. Strengthening the Value of Informal Response	98
	3. Frequency of Use and Potential Adoption of Command Methodologies During the Response to Surge Events	100
F.	CONCEPTS TO ENHANCE DECISION MAKING	103
	1. Ranking the Priority of Investment in Decision Aids.....	103
	2. Ideas on Decision Aids	106
G.	COMPARATIVE ANALYSIS: GERMAN VERSES U.S. IMS	107
	1. Potential Adoption of German IMS Principles.....	107
	2. Potential Benefits of Adoption	110
	3. Potential Concerns of Adoption	110
H.	INNOVATION AND CREATIVITY	110
	1. Ideas to Enhance the Ability to Cope with Unfamiliar Situations	110

I.	CONCLUSION	112
VII.	FINDINGS AND RECOMMENDATIONS	115
A.	INTRODUCTION	115
B.	RESEARCH QUESTION FINDINGS.....	118
C.	IMPLEMENTATION OF INCIDENT CONTROL STRATEGIES.....	131
D.	ITEMS FOR ACTION / IMPLEMENTATION AND CHALLENGES..	136
1.	Short-term Proposals and Considerations.....	136
2.	Long-term Proposals and Considerations	137
E.	SUGGESTIONS FOR FUTURE RESEARCH	138
F.	CONCLUSION	139
APPENDIX A.	QUICK ACTON FIELD OPERATIONS GUIDE	143
APPENDIX B.	CONFIRMATION EMAIL.....	147
APPENDIX C.	DELPHI SURVEYS ONE THROUGH THREE.....	149
APPENDIX D.	DELPHI SURVEY DATA.....	183
BIBLIOGRAPHY	ERROR! BOOKMARK NOT DEFINED.	
INITIAL DISTRIBUTION LIST		287

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF FIGURES

Figure 1.	Cynefin Framework Diagram (From Snowden 1999)	13
Figure 2.	German Command Chart (From DV 100).....	35
Figure 3.	NIMS Based Command Chart (NIMS).....	35
Figure 4.	German Circular Mission Process (From DV 100).....	36
Figure 5.	German Command Team Structure to control a company “Zug” (From DV 100).....	37
Figure 6.	German Command Staff Functions (From DV 100)	38
Figure 7.	Decision Aid Investment Rating Chart (Produced by the author based on Round Three responses)	105
Figure 8.	Everett Rogers Innovation Life Cycle (From Everett Roger Diffusion of Innovations 2003)	133
Figure 9.	Everett Rogers 1995 Adoption Curve (From Everett Rogers Diffusion of Innovations, 2003)	134

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

Table 1.	Delphi Observations Improvising and Adapting ICS	40
Table 2.	Delphi Survey Round One Sample Questions.....	49
Table 3.	Round One Sample -- Years of Fire Service	50
Table 4.	Round One Sample – Years of Command Experience	51
Table 5.	Round One Sample – Most Frequent Command Position.....	51
Table 6.	Thematic Responses Identifying Signals of Incident Transformation .	53
Table 7.	Responses Identifying Signs of Incident Transformation.....	59
Table 8.	Reaction to the Absence of Expected Signals.....	65
Table 9.	Changes in Decision-making Strategies.....	66
Table 10.	Delphi Survey Round Two Sample Questions.....	73
Table 11.	Strategic Options When Faced with Limited Resources.....	75
Table 12.	Regional Strategies to Improve Response	77
Table 13.	Strategies to Manage and Filter Information Flow	79
Table 14.	Importance of Signs of Incident Transformation	82
Table 15.	Ranking the Top Five Signals of Incident Transformation	83
Table 16.	Somewhat Important Themes Identifying Signs of Incident Transformation	84
Table 17.	Comments that NIMS is the Optimal IMS Model	86
Table 18.	Comments that NIMS is Not the Optimal IMS Model.....	86
Table 19.	Observations Improvising and Adapting ICS	88
Table 20.	Delphi Survey Round Three Sample Questions	93
Table 21.	Ideas to Improve Second and Third Tier Mutual Aid Response	94
Table 22.	Frequency of Use and the Potential of Adoption of Strategies to Enhance Command Capacity during Routine Command Operations.	96
Table 23.	Ideas to Enhance the Value of the Informal Response of CFOs	99
Table 24.	Identification Frequency of Use and the Potential of Adoption Command Methodologies during the Response to Surge Events	101
Table 25.	Top Priority Investments.....	104
Table 26.	Medium Priority Investments	104
Table 27.	Low Priority Investments	105
Table 28.	Ideas for Decision Aids.....	107
Table 29.	Adoption of Comparative Concepts.....	108
Table 30.	Creative Ideas to Cope with Unfamiliar Events	111

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

CHDS	Center for Homeland Defense and Security
CFO	Chief Fire Officer
COML	Communications Leader
CP	Command Post
DV 100	Deinstvorschrift 100
EFOP	The Executive Fire Officer Program at the National Fire Academy
FOG	Field Operations Guide
GIS	Geographic Information Systems
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IMS	Incident Management System
IMT	Incident Management Team
MCI	Mass Casualty Incident
MFIRS	Massachusetts Fire Incident Reporting System
NFA	National Fire Academy
NGO	Nongovernmental Organization
PIO	Public Information Officer
RPD	Recognition Primed Decision-making Model
Web 2.0	A concept that takes the network as a platform for information sharing, interoperability, user-centered design, and collaboration on the World Wide Web
USFA	United States Fire Administration

THIS PAGE INTENTIONALLY LEFT BLANK

EXECUTIVE SUMMARY

As an emergency incident develops, command structures are formulated to direct resources. During routine events, experience, intuition, patterns and cues are utilized to make strategic decisions. When formulating an operational plan during routine events, the majority of Incident Commanders (ICs) use perception, comprehension and projection to identify the potential ramifications of the unstable situation. Surge events are defined as complex and chaotic emergency incidents that require resources well beyond normal operating capacity. These surge events are rare, and of such a magnitude, that the Incident Commander is confronted with a unique situation that often exceeds his/her experience and ability to improvise and adapt to changing conditions.

This thesis utilizes a Delphi survey methodology to obtain the perspective of experienced Incident Commanders to determine the signals that an incident is becoming nonroutine and unfamiliar, inventory decision-making methods during unfamiliar events and identify strategies that have the potential to enhance decision making. This thesis identifies best practices and inventories strategic options that can assist Incident Commanders, as they are faced with fast-moving, unpredictable and ever-changing crisis situations. The knowledge obtained through this research is offered with a desire to enhance the ability of Incident Commanders to make effective decisions when lives are most at risk.

Decision making during emergency operations relies on both situational and personal factors. On the personal level, experience, patterns and cues form the basis for decision making. Situational factors include the extent of situational awareness, resource availability, command capability and the capacity for collaboration. In this context, the seasoned Chief Fire Officer (CFO), who has demonstrated exceptional knowledge, skill and ability when faced with routine situations, can transition to a novice when faced with unfamiliar incidents that often exist in the chaotic context. This project identified 18 themes that signal the transition from the routine toward the unfamiliar. These themes can inform ICs

that an incident is becoming emergent and produce an anticipatory strategy that has the potential to harness this higher level of situational awareness and produce a more effective response effort.

A variety of strategies to deal with the unexpected exist. This thesis created an inventory of possible strategies that can broaden the preparatory and response based options of ICs. The Delphi survey process indicated that responders have a high receptivity to adopting concepts that they have not previously utilized.

ACKNOWLEDGMENTS

This thesis represents the culmination of 18 months of the most intense educational experience I have had the privilege to experience. This learning opportunity has allowed me to grow in many ways. The Center for Homeland Defense and Security (CHDS) has afforded me the opportunity to build a new network of friends and colleagues. Cohorts 1103 and 1104 are an exceptional groups of men and women to whom I am grateful. I have learned a lot from each of you. I will always remember the great learning experience and networking that we all shared in West Virginia.

Thank you to Susan Hocevar and John Rollins for their invaluable guidance, assistance and suggestions to improve this thesis. I would especially like to recognize Susan for the tremendous effort she put in to helping me shape the aspects of the Delphi Survey process and analysis. I truly appreciate the endless emails, and numerous conference calls that represent the extra effort she put into helping me through this process.

A special thank you goes to my family for their support during the last year and a half. During this educational journey, I have placed many aspects of my life on hold. I appreciate the support of both my parents, Mary and Paul Duggan, along with my daughter, Ashley, as they have encouraged me to reach my goal and personally and professionally excel as I approached this challenge. As I needed to prioritize my time, I missed many weekends of riding our horses, skiing, traveling, and working to maintain our farm. My wife Maryanne picked up what I could not do around our farm and provided me with a unwavering support to meet the intense challenges of this Master of Arts program. I will never forget spending our 25th wedding anniversary on the streets of Shepherdstown, West Virginia and look forward to having more time to spend with my partner and best friend.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. PROBLEM STATEMENT

As an emergency incident develops, command structures formulate to effectively and efficiently direct resources. During events that responders deal with on a regular basis, experience, patterns and cues are utilized to make strategic decisions that will produce an appropriate response capability, thus, minimizing the impact of the event and the cost of response. When formulating an operational plan during routine events, the majority of Incident Commanders function as experts and use perception, comprehension and projection to identify the potential ramifications of the unstable situation.¹ In the absence of familiar patterns and cues, experienced Chief Fire Officers (CFOs) employ analysis to recognize that something is wrong and transition toward defensive options that emphasize operational sustainability and safety.²

Experts³ use experience to sift through available information, disregard irrelevant information and focus on the key data points that matter. Gladwell notes that this process is assisted by the unconscious mind through both rapid cognition and intuitive repulsion.⁴ Rapid cognition is the ability to rapidly recognize patterns and cues inherent to ones experience while intuitive repulsion is the ability to quickly recognize that something is not right. Using these concepts, experience is a valuable tool that can provide context to a situation.

¹ Roberta Calderwood, Beth W. Crandall, and Gary A. Klein, *Expert and Novice Fire Ground Command Decisions* (Yellow Springs, OH: Klein Associates, Inc., 1987).

² Gary A. Klein, "A Recognition-Primed Decision (RPD) Model of Rapid Decision-making," in *Decision-making in Action: Models and Methods*, ed. Gary A. Klein (Norwood, NJ: Ablex Pub., 1993), 139.

³ Expert—for the purpose of this thesis, an expert is defined as a experienced fire officer who has a comprehensive and authoritative knowledge, ability and skill within the realm of emergency response and incident command. These professionals think and reflect on past experience as a basis for decision-making.

⁴ Malcolm Gladwell, *Blink: The Power of Thinking Without Thinking*. New York: Little, Brown and Company, 2005, 8, 119.

Surge events are defined as complex and chaotic emergency incidents that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism-related events. In these novel situations, the event progresses beyond the normal operating capacity of the host community and expands into a multi-agency response that typically encompasses the use of three levels of mutual aid as listed below:

- Tier One - Mutual aid from neighboring communities that is utilized on a frequent basis;
- Tier Two - Regional mutual aid from adjacent areas;
- Tier Three - Activation of formal statewide mobilization plans.

These surge events are rare and are of such magnitude that the Incident Commander is confronted with a unique situation that often exceeds his/her experience and ability to improvise and adapt to changing conditions. The absence of patterns and cues creates an unfamiliar operational environment and challenges the knowledge, skill and ability of the IC.⁵ This uncertainty produces a high stress operational environment marked by incomplete information, the presence of significant external influences, such as the media, time pressure, and life safety concerns. Although these events are unique, there are certain signals and strategic options that are common and are identified to help the IC optimize a strategy to address the wicked problems created by these asymmetric events.

Disorder, confusion and numerous high priority decision points that demand the ICs immediate attention often mark the transitional period from the routine to the unfamiliar. Secondary to the transition from a complex to a chaotic situation, all but the most experienced and adaptive fire service leaders have the potential to become overwhelmed and they often revert to applying familiar

⁵ Klein, *Recognition-Primed*, 139.

tactics to unfamiliar situations. These rare events produce a high consequence condition that often signals a significant deterioration in decision making. Thankfully, large-scale disasters occur relatively infrequently.

Local public safety leaders are tasked with managing these infrequent situations; yet, they often lack a sufficient level of experience that could guide effective decision making. When faced with unexpected situations, novices tend to react to the unfamiliar while an expert would think and reflect upon experience as a guide to effective decision making.⁶ Typically, a novice makes reactionary decisions based upon values, upbringing and the evaluation of strategic options that return to the familiar. These reactive actions may not be appropriate to the situation. Driving a car can serve as a comparative example. As a driver develops skill and experience, he/she transitions from a reactive posture of a novice to an anticipatory posture of defensive driving. However, even a seasoned driver would once again be a novice, if he/she were thrust into the driver's seat of a racecar.

As an example of an Incident Commander's struggle to identify the unfamiliar, on June 18, 2007, a rapidly growing fire consumed a furniture store in Charleston, South Carolina. During this event, first arriving crews entered the structure for the purpose of rescue and fire suppression. As the IC arrived on the scene, he did not identify the unfamiliar and recognize that the fuel load⁷ in the structure offered a potential for disaster. Missing this sign of danger, routine operations continued and tragedy quickly ensued as a fast moving fire propelled by the fuel load of stored furniture killed nine of the first arriving firefighters. In this situation, the Incident Commander, who was clearly an expert fire officer, became a novice when dealing with an unfamiliar situation that posed an immediate danger to firefighters operating within the structure.

⁶ Calderwood, Crandall, and Klein, *Expert and Novice Fire Ground Command Decisions*.

⁷ Fuel load— the total amount of combustible material in the defined space surrounding a fire. A high fuel load will produce rapid combustion, intense fire spread, and high heat and smoke production.

There may be ways to help Incident Commanders operate more effectively and efficiently in unfamiliar situations. The development of collaborative teams provides an opportunity to build upon collective wisdom, develop enhanced situational awareness and dissect the problem at hand.⁸ Barriers often exist to the development and rapid deployment of these teams based on social aspects ranging from organizational culture to groupthink and tribalism. Developing collaborative solutions remains both a social and technical challenge that has eluded resolution in many jurisdictions.

A review of pertinent literature reveals that a wide variety of factors influence the period of transition from the routine to the unfamiliar and contribute to the overall success of response efforts, and ultimately to the maximization of public value. These factors can include; social identity, personality, relationships, independence, collaboration, previous experience, skill level, communication capability, technology, situational awareness, and organizational culture. This thesis examines the symptoms, patterns and cues that mark the transition from the complex context toward the danger of the chaotic and unfamiliar. This research is directed toward the development of innovative strategic options to enhance the depth and adaptive nature of incident command structures in the face of chaotic and uncertain situations.

In an effort to investigate this topic properly, respected practitioners were engaged to identify the signs of impending transition and examine potential change in decision-making strategies as leaders face the unfamiliar. Through this process, critical success factors were identified, and opportunities considered for application of these concepts to enhance decision making during the transformative period of incident escalation.

⁸ Abdo Nahmod, "The Collaborative Capacity of the NYPD, FDNY, and EMS in New York City: A Focus on the First Line Officer" (Master of Arts in Security Studies (Homeland Security and Defense), Naval Postgraduate School).

B. PURPOSE OF THIS STUDY

The purpose of this study is to improve the understanding of decision-making processes during the initial response to surge incidents and to assist Incident Commanders in the rapid identification of surge events that often transition toward the chaotic context. This study explores the challenges of decision making during the fast paced, confusing and ever-changing environment of surge incidents. Experienced CFOs were surveyed in an effort to identify signals that an event is becoming nonroutine and unfamiliar and to identify best practices for decision making during these fluid and often overwhelming situations. The data gathered through this study identifies strategies to enhance decision making during the initial operational period of these rare but potentially dangerous crises.

Through a three-tiered process of probing the knowledge and experiences of survey participants, this research describes the signals that an event is becoming unfamiliar and identifies strategic options for enhancing decision-making methodologies and capacity. Identifying the signals that an event is escalating toward the unfamiliar provides the opportunity for Incident Commanders to gain an added level of intuitive thinking. These identified best practices offer an IC strategies to increase operational performance and avoid potentially tragic outcomes.

C. RESEARCH QUESTIONS AND METHODOLOGY

The goal of this research is to provide Incident Commanders with tools that can assist them in enhancing decision making during the initial operational period of surge events.

The two primary research questions are:

- 1. As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate that a different method of decision making is necessary?**

2. What strategies can be utilized to enhance decision making during the initial response to chaotic surge incidents?

This study uses a Delphi survey to elicit responses from CFOs who are either graduates of the National Fire Academies (NFA) Executive Fire Officer Program (EFOP) or participants in the Massachusetts Fire Incident Reporting System (MFIRS). The Delphi survey included both quantitative and qualitative questions. Quantitative questions sought the identification of statistical information and rated the importance of signals and the frequency of command staff assignments. Qualitative questions included requests to identify important signals, inventoried adaptive strategies and consider options to manage information. Survey data was analyzed and summarized to address each of the research questions listed above. Details on the methodology employed follow in subsequent chapters.

D. ORGANIZATION OF THIS THESIS

Chapter I of this thesis introduces the research topic and provides the reader with context. Chapter II presents a literature review of decision making during crises, situational awareness, and collaboration. Chapter III provides a comparative analysis of incident management procedures between the United States and Germany. Chapters IV through VI detail the methodology and results of the three-tiered Delphi Survey collected from a sample of CFOs. Chapter VII presents thesis findings, recommendations to enhancing decision making, and identifies questions for future research.

II. LITERATURE REVIEW

A methodical review of literature was conducted from September 2011 through August 2012 to retrieve the available information and identify gaps pertinent to the adaptive capacity of command decision making during the initial operational period of disaster response. This search revealed two primary areas of relevant research including leadership/decision making and situational awareness. The use of geographic imagery and the development of collaboration were determined to be peripheral areas of research.

A. COMMAND DECISION MAKING

Command decisions in the high-risk, time sensitive environment of emergency response are required by the need for immediate action. First responders often confront the challenge of responding to novel incidents with a lack of both exposure and experience.⁹ Exposure consists of having a presence at events of similar magnitude, while experience is the knowledge and skill acquired in a profession through observation and mentoring. Lacking a solid foundation of both exposure and experience, Incident Commanders can easily fall back on personal belief, morals, values and upbringing as a source of reactive decision making when managing the response to disasters.¹⁰ As effective decision making is a learned domain, decisions need to emanate from a wealth of both experience and judgment.

In 1987, Gary Klein, a well-known expert on fireground command decision making, developed a descriptive model of the naturalistic decision-making process. This research identified that many command decisions are reflective of

⁹ Neil R. Hintze, "First Responder Problem Solving and Decision-making in Today's Asymmetrical Environment" (Master of Arts in Security Studies (Homeland Security and Defense), Naval Postgraduate School), .
http://edocs.nps.edu/npspubs/scholarly/theses/2008/Mar/08Mar_Hintze.pdf. P V.

¹⁰ Robert T. Mahoney, "Deciding Who Lives: Considered Risk Casualty Decisions in Homeland Security" (Master of Arts in Security Studies (Homeland Security and Defense), Naval Postgraduate School), 166.

the Incident Commander's previous experience.¹¹ As an example, a capable and experienced commander referencing his/her previous field experience may order the evacuation of an entire city block based on a similar experience where a collapse resulted in injuries to bystanders when only the buildings adjacent to the fire were evacuated. In this example, the commander employed the lens of his/her experience to make a safer decision.

Klien's work is complimented by Gladwell's concept of thin slicing where the unconscious mind finds patterns in situations based on a comparison of very narrow slices of experience.¹² Thin slicing utilizes rapid cognition to zero in on what really matters and utilizes intuitive repulsion to know instinctively that something is not right.¹³ Gasaway argues that intuition is a vital component of decision making, especially when the decision maker is under stress, such as during combat operations. Intuition produces decisions much quicker, as it relies on the Incident Commander's experience without having to analyze every aspect of the problem. Emotional memory is derived from one's experiences and may guide the decider through what ICs often attribute to a "gut feeling". In these instances, commanders instinctively know what to do, although they may not quite know why.¹⁴

Intuition is not fool proof, as it is closely related to pattern recognition and can lead to the wrong decision. Sometimes this recognition leads to the wrong conclusion and often occurs when the event is unfamiliar and beyond the experience of the commander.¹⁵ Gasaway further notes that significant parallels

¹¹ Calderwood, Crandall and Klein, *Expert and Novice Fire Ground Command Decisions*, iii.

¹² Gladwell, *Blink*, 47.

¹³ Ibid., 119.

¹⁴ Richard B. Gasaway. "Making Intuitive Decisions Under Stress: Understanding Fireground Incident Command Decision-Making." *International Fire Service Journal of Leadership and Management* 1, no. 1 (2007): 11.

¹⁵ Gasaway. *Making Intuitive Decisions*, 15.

exist between decision-making methodology on the battlefield and during the response to unpredictable emergency incidents.¹⁶

This foundational research outlines the differences that exist between experienced commanders, known as experts, and relatively inexperienced commanders known as novices. In an emergency setting, veteran responders use the benefit of experience to face unfamiliar situations and focus on addressing complex situational aspects. In contrast, the novice has limited experience and typically focuses on utility, concurrent evaluation, implementation and timing when facing the unfamiliar. Experts also have the capability to construct innovative options using mental imagery in a research study they were twice as likely to consider future contingencies in the context of their decision making.¹⁷ This research provides a strong case for the value of experience and suggests that support systems, such as geospatial information tools, incident management teams (IMTs), and reconnaissance efforts can provide a more accurate situational assessment.¹⁸

Experience changes the nature of a person's first impressions, helps the expert sift through the situation, and throws out the irrelevant while zeroing in on what really matters.¹⁹ Experts utilize learned behavior and training to interpret and decode a situation. Gladwell identifies that experience is the foundation for the snap judgments that are critical to the spontaneity required as first responders address emergencies.²⁰

Considering the time pressure inherent to effectively managing an emergency, generating, and then considering several potentially viable options is precluded. In fact, the time taken to consider multiple alternatives may allow the

¹⁶ Gasaway. *Making Intuitive Decisions*, 9.

¹⁷ Calderwood, Crandall and Klein, *Expert and Novice Fire Ground Command Decisions* P iii.

¹⁸ Ibid.

¹⁹ Gladwell, *Blink*, 142.

²⁰ Ibid.

emergency to expand producing unacceptable losses prior to the selection of an appropriate course of action. Gasaway notes that conditions of an unstable, fast moving incident rarely improve when the Incident Commander procrastinates on time-sensitive decisions.²¹ Klein indicates that less than 20 percent of decisions of the fireground involve the concurrent evaluation of multiple potential courses of action.²² Deliberation that does occur focuses on the nature of the problem itself and places a strong emphasis on the need for a high level of situational analysis as a prerequisite to operational success.

As artists, experts use the foundation of experience to evaluate patterns, observe cues and create the adaptive capacity²³ to consider complex and uncertain decision points. To illustrate this point, a novice often breaks down a single decision point for an expert into several time-consuming decision points. As an example, a fire officer may be well versed and considered to be an expert when dealing with a residential structure fire but be relatively inexperienced and considered to be a novice when commanding the response to a release of sulfuric acid.

The concept of naturalistic decision making was further expanded in 1993, as Klein developed the Recognition Primed Decision-making Model (RPD). This model identifies that reflection on prior experience as a means to identify patterns in emergency response avoids some of the limitations of analytical strategies and provides the ability to make rapid decisions in complex field situations. Traditional decision-making models utilized in nonemergency situations have the advantage of time to develop and consider a host of viable alternatives. Considering the time pressure inherent to emergency response, RPD indicates that fireground

²¹ Gasaway, *Making Intuitive Decisions*, 9.

²² Calderwood, Crandall and Klein, *Expert and Novice Fire Ground Command Decisions*, v.

²³ **Adaptive capacity** is the capacity of a [system](#) to adapt, if the environment where the system exists is changing.

decisions do not fit into a typical decision tree and identifies that choice points rely on the leader's ability to recognize and appropriately classify a situation.²⁴

RPD appears to be a productive strategy that uses the lens of experience to generate, evaluate, and then rapidly implement the course of action most likely to be successful. Emergency response does not provide the luxury of time to find the optimal course of action. Instead, the concept of satisficing, which facilitates the selection of a good workable option as opposed to the optimal option, is employed. Expert commanders utilize mental simulation to determine if the option selected through satisficing will work, as it is applied to the situation at hand. This strategy requires the prerequisite of comparative experience to provide a perspective that facilitates the rapid commitment and action needed during emergencies. Although RPD provides a model for action, novices often revert to more time consuming, analytical actions as they lack the relevant experience required to utilize RPD.²⁵

RPD has become a time-tested foundational model that explains the principles of decision making in emergency response settings.²⁶ RPD differentiates the capabilities of novices and experts and notes that training in situation recognition could improve performance. RPD stands as a strong aspect of understanding decision making in emergencies, but it is not a comprehensive answer to the research questions posed, as it fails to consider the propensity for unstable incidents to expand into the chaotic context.

The Cynefin Framework identifies that decision making in emergency response situations primarily exists in the unordered complex domain where unpredictability and flux are common.²⁷ This framework is the first to consider and classify the magnitude of emergency events and suggests that events can

²⁴ Klein, *A Recognition*, 139.

²⁵ Ibid., 145.

²⁶ Ibid.

²⁷ Snowden and Boone, *A Leader's Framework for Decision-making: A Leader's Framework for Decision-making*, 68–76.

transition from the complex context into the chaotic complex. This model provides leaders with the ability to see things from new viewpoints, assimilate concepts, and, based on the active operational context, pursue different decision-making strategies.²⁸ The Cynefin Framework is a system typology developed by David Snowden in 1999. This framework classifies situations into five domains including; simple, complicated, complex, chaotic, and disorder (see Figure 1). The Cynefin Framework indicates that emergency incidents typically exist in the complex context where a leader would need to probe the situation, sense the problem, and the respond. In this situation, patterns that lead to resolution emerge as a guide to decision making. This domain of the model would challenge a novice, but according to RPD, be manageable for an expert decision maker.

In rare instances, such as during the initial response to the surge events associated with acts of terrorism or natural disasters, situations become chaotic. During these abnormal situations that transition into the chaotic context, no patterns exist, and the leader needs to first act to establish order and then convert the situation into the complex context where patterns emerge.²⁹ The transformation from the complex to the chaotic context indicates that a different approach is needed in these situations, but Snowden's research does not reflect on how relative experience affects the transformational capability of the individual.

²⁸ Snowden and Boone, *A Leader's Framework for Decision-making: A Leader's Framework for Decision-making*, 1.

²⁹ Ibid., 3.

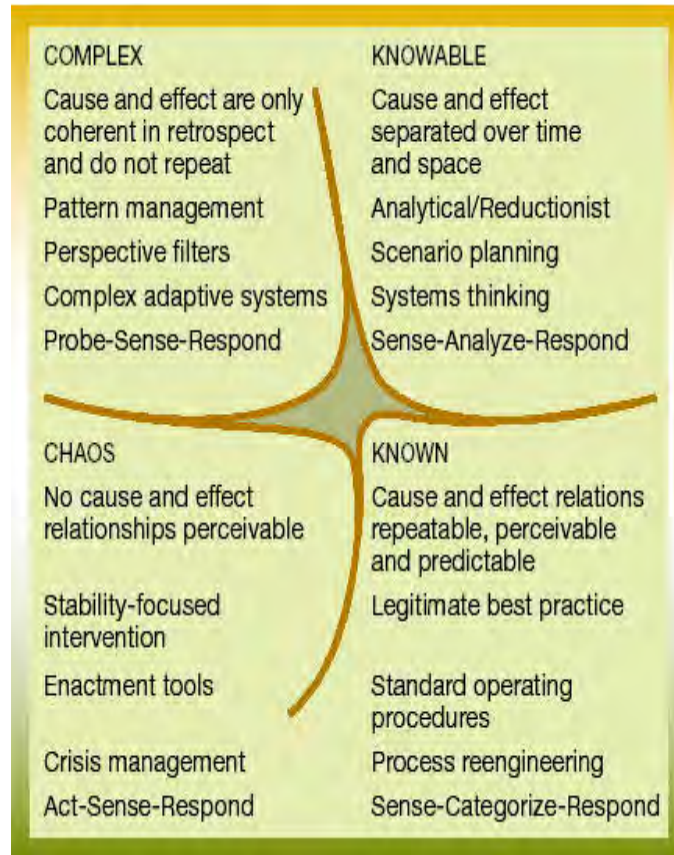


Figure 1. Cynefin Framework Diagram (From Snowden 1999)

In his article on the 2009 crash of Air France Flight 447, Wise presents an example of both the need for experience to address chaotic events and indicates how an expert can regress to a novice when confronted with a novel situation. As flight 447 flew over the Atlantic Ocean, an experienced co-pilot, who would be an expert under normal conditions, misperceived a complex and unfamiliar situation. At one point, the co-pilot exclaims “I don’t understand what is happening.” This misperception, which was based on a lack of both training and relative experience, caused the situation to become chaotic.³⁰

³⁰ Jeff Wise, "What Really Happened Aboard Air France 447." *Popular Mechanics* (December 6, 2011). 7.

The intense psychological pressure of this novel event shut down the part of the brain that is responsible for creative and innovative thought.³¹ This caused the co-pilot to react and return to the familiar. Regressing to familiar actions that were inappropriate in this situation ultimately contributed to the crash.

Building upon aspects of the material referenced above, Diaz examined how decisions are made in rare, “novel” environments, such as in a terrorist attack where first responders have little or no familiarity with the situation, as they lack the frame of reference provided by experience.³² During these events, commanders employ sense making to decode the unbelievable or unfamiliar. Lacking both experience and key pieces of situational information, decision makers are often reluctant to act. This paralysis produces response delays that detract from operational effectiveness. In these situations, even the most experienced Incident Commanders can easily be overwhelmed and experience stress. A common aspect of stress is information overload. As the human brain limits information flow based on overload, less than optimal decisions can be produced by the brain’s protective action that may limit the cognitive knowledge of essential situational information.³³

Diaz presents ten common factors that affect the quality of decision making during the response to novel situations. These factors can serve to enhance or deteriorate the quality of decision making in the chaotic environment. These include; control of the situation (or lack thereof), control of arousal, openness to the environment, having an active role in the decision-making process, the ability to imagine the outcome through mental simulation, collective problem solving ability, perspective, information, and comfort working in an

³¹ Jeff Wise, "What Really Happened Aboard Air France 447." *Popular Mechanics* (December 6, 2011). 7.

³² Sara K. Diaz, "Where Do I Start? Decision-making in Complex Novel Environments" (Master of Arts in Security Studies (Homeland Defense and Security), Naval Postgraduate School). 3.

³³ *Ibid.*, 10.

unknown situation.³⁴ Diaz recommends following principles to serve as a guide for leaders, as they approach these critical situations:

1. Work in a manner not to exceed memory capacity
2. Monitor and regulate emotion
3. Consider the memory capacity of subordinates.

Synthesizing the findings of Klein and Snowden, when an emergency exists in the chaotic context of the Cynefin Framework, insufficient patterns and cues exist to apply RPD. In chaotic situations, an effective leader needs to generate widespread cohesive action that expands their domain of influence and leverage.³⁵ The concept of Meta-leadership capability considers the ability of the leader, the situation, designated authority and the ability to engender collaboration through influencing both superiors and other organizations.³⁶

Meta-leaders are those individuals whose scope of thinking, influence and accomplishment extends far beyond their formal or expected bounds of authority. These individuals have the unique capacity to generate widespread cohesive action that expands their domain of influence and leverage.³⁷ Crises allow extraordinary meta-leaders to emerge. Marked by strength of character and keen analytic skill, these unique leaders have the ability to lead, follow and productively engage others. These qualities forge an impact and level of collaboration not otherwise attained.³⁸

³⁴ Diaz, *Where Do I Start* 11.

³⁵ Leonard J. Marcus et al., *The Five Dimensions of Meta-Leadership* (Cambridge, MA: National Preparedness Leadership Initiative, Harvard School of Public Health, 2007). 2.

³⁶ Ibid., 2, 28.

³⁷ Ibid., 2.

³⁸ Marcus et al., *The Five Dimensions*. 24.

Three aspects of decision making during emergency response are discussed within this portion of the literature review. These research concepts are cumulative in that they complement and build upon each other. These models are:

1. Recognition primed decision making (RPD), as developed by Klein
2. Thin slicing and intuitive repulsion by Gladwell
3. The Cynefin Framework for decision making by Snowden
4. The role of meta-leadership that influence decision making during novel situations by Marcus.

Although each aspect provides insight, all four models rely on the experience of experts for the effective management of the initial phase of emergency response. The need to develop novices into experts through both exposure and experiential training and mentoring is not addressed, nor is the concept that a person may be an expert in one situation and transform into a novice when facing the unfamiliar chaotic situation. As it is difficult to prepare for tragic situations that have not yet been envisioned, consideration should be given to developing tools that can enhance decision making in unfamiliar environments for both novel and expert decision makers, who will face both complex and chaotic emergency situations.

B. AGILITY AND DISCIPLINE

In contrast with the models presented, Harrald indicates that expertise is not a singular solution; instead, a balance of both agility and discipline are required to successfully mitigate emergency incidents. Discipline includes structure, doctrine, and process. Agility includes the ability to innovate through the National Incident Management System (NIMS), which is typically a closed and rigid system.³⁹

³⁹ John R., Harrald, Josep Barbera, Irmak Renda-Tanali, Damon Coppola, and Gregory L. Shaw. *Observing and Documenting the Inter-Organizational Response to the September 11th Attack on the Pentagon*. Washington, DC: The George Washington University, Institute for Crisis, Disaster and Risk Management, 2002. 261.

Extreme events produce unforeseen problems and conditions requiring adaption, improvisation, and creativity to deliver services under extreme conditions. In these rare cases, discipline that includes structure, doctrine, and process must be balanced by creativity, improvisation and adaptability. In these novel situations, there is a tradeoff between the command and control necessary for mobilization, and the need to ensure broad coordination and communication.

When facing extreme events, response must begin without a complete situation or needs assessment. During this initial period, it should be expected that a detailed, credible common operating picture may not be available for twenty-four to forty-eight hours.⁴⁰ Often, the initial response is conducted by resources in the area reacting to the immediate needs of the situation, while external resources are mobilized to address the situation comprehensively.⁴¹

C. SITUATIONAL AWARENESS

Obtaining timely and accurate information about a situation is essential to making the best possible decisions, as first responders engage in crisis events. Each of the decision-making sources cited outline the necessity of developing situation-based information as a precursor to effective decision making. Therefore, situational awareness appears to be a direct link to operational success.

Decision making in high-stress emergency response environments is subject to time pressure, significant uncertainty, and life safety concerns, and these factors require that an effective IC develop a high level of situational awareness.⁴² Emergency situations are fast paced, confusing and evolving,

⁴⁰ John R., Harrauld, Josep Barbera, Irmak Renda-Tanali, Damon Coppola, and Gregory L. Shaw. *Observing and Documenting the Inter-Organizational Response to the September 11th Attack on the Pentagon*. Washington, DC: The George Washington University, Institute for Crisis, Disaster and Risk Management, 2002. 261.

⁴¹ Ibid., 257.

⁴² U.S. Department of Commerce. National Oceanic and Atmospheric Administration, *Situation Awareness and Decision-making in a Warning Environment* (Washington, DC: National Oceanic and Atmospheric Administration. 7.

which creates the demand for certainty and leads to a demand for information, but in the early chaos of an events, this information may often be incorrect and misleading. Seldom, if ever, will information obtained during the initial response to surge incidents be accurate⁴³. Gasaway notes that the Incident Commander needs to piece together a semblance of what is actually happening as the incident evolves.⁴⁴

Situational awareness is the art of understanding your surroundings while developing three levels of environmental awareness. These levels are perception, comprehension, and projection.⁴⁵ Perception is the ability to evaluate the crisis. Comprehension builds upon perception and forms when the leader understands the possibilities and ramifications associated with an event. Projection is the ability to predict the path of the event and then order a response that complements both present and future incident conditions.⁴⁶ Hintze indicates that proper evaluation of a situation is key to forming a perception. Perception stands as a cornerstone of understanding, but perception is often limited by poor information flow and the human tendency to filter information and find information to support our pre-existing conclusions.⁴⁷

Gasaway notes that a challenge to good situational analysis is the complexity of systems during an emergency response. As an incident develops, the complexity of systems increases, which in turn increases the mental workload of the Incident Commander. In these cases, the mental workload required to achieve a given level of situational analysis is immense, and when human capability is exceeded, situational analysis will suffer.⁴⁸

⁴³ Gasaway, *Making Intuitive Decisions*, 9.

⁴⁴ Ibid., 10.

⁴⁵ Hintze, *First Responder Problem Solving*, 18.

⁴⁶ Ibid., 18.

⁴⁷ U.S. Department of Commerce. National Oceanic and Atmospheric Administration, *Situation Awareness and Decision-making in a Warning Environment*. 40.

⁴⁸ Gasaway, *Making Intuitive Decisions*, 13.

Once a leader understands the situation, he/she can then begin to identify the patterns and cues identified within Klein's research on RPD to mitigate the situation. Pfeifer claims that gathering situational awareness empowers the Incident Commander to make sense of a situation and anticipate shifting conditions.⁴⁹ This concept is recognized in the research of both Klein and Diaz. In essence, situational awareness is developing a big picture or macro view of an event. McNealy provides a battlefield perspective, by observing that situational awareness is "the continuous extraction of information, integration of this information with previous knowledge to form a coherent mental picture in directing future perception and anticipating future events."⁵⁰

Often the level of information during a crisis event is overwhelming. Diaz states that this quantity of information, common to emergencies, needs to be filtered to reduce overload of memory capacity.⁵¹ Salience of data needs to be considered as information is evaluated. One concern is the human tendency of misplaced salience, which occurs when an absence of data is assumed to indicate that a phenomenon does not exist.⁵² Flexibility in emergency response decision making depends on identifying cues and understanding the context of an event. The absence of patterns and cues reflects back to the value of experience identified within the Naturalistic Decision-making Model. Leveraging experience, a commander can utilize the absence of familiar patterns and cues called "broke pattern matching" to identify the absence of the familiar and sense danger.⁵³

⁴⁹ Joseph W. Pfeifer, "Command Resiliency: An Adaptive Response Strategy for Complex Incidents" (Master of Arts in Security Studies (Homeland Security and Defense), Naval Postgraduate School). 15.

⁵⁰ John M. McNealy, "Best Practices to Develop Situational Awareness in Dynamic Small Group Military Settings" (Master of Science in Library Science, University of North Carolina at Chapel Hill). 10.

⁵¹ Diaz, *Where Do I Start*, 5.

⁵² U.S. Department of Commerce. National Oceanic and Atmospheric Administration, *Situation Awareness and Decision-making in a Warning Environment* (Washington, DC: National Oceanic and Atmospheric Administration, 2006). 17.

⁵³ Pfeifer, *Command Resiliency*, 18.

Another common finding is that situational awareness should not be constrained by organizational boundaries. Stovepipe situational awareness develops when information is held in organizational silos and not shared between agencies. This lack of information sharing reflects organizational culture, bias, previous history, inter-organizational conflict or interoperability limitations. In his thesis, Pfeifer provides an example of how information held by the NYPD on 9/11 contributed to catastrophic consequences.⁵⁴ In this case, information was retained within the stovepipe of a single organization based on history and conflict.

The concept of novices and experts exists within the realm of situational analysis. Hintze claims that a novice reacts; often taking either too much time to determine the best course of action or selecting inappropriate actions. In the alternative, experts think and reflect on past experience.⁵⁵ As a result, experts are better able to process information. Experience allows experts to develop comparative models while a novice allows the complexity of the problem to be a distraction. Experts have a high capability of framing the problem and looking for pattern matches.⁵⁶

Charles Burkell, Director of the National Fire Academy, Executive Fire Officer Program, said “in the absence of experience, fire service organizations need to include time pressure, shifting conditions, and information gaps in training exercises as a way to build proficiency in lieu of having been there and done that.”⁵⁷ Building on the statement from Burkell, Hintze claims that the concept of experts and novices identifies the need for simulation-based training

⁵⁴ Pfeifer, *Command Resiliency*, 16. Pfeifer claims that on 9/11 signs of imminent collapse of the North Tower of the World Trade Center were observed by NYPD helicopters. This information was transmitted to NYPD Emergency Service Units (ESU) personnel resulting in an urgent evacuation of the building. These observations were not shared with fire department commanders and an orderly evacuation of fire department personnel resulted in the loss of personnel.

⁵⁵ Hintze, *First Responder Problem Solving*, 21.

⁵⁶ Ibid.

⁵⁷ Ibid., 28.

and mentoring as tool that can help a novice build proficiency.⁵⁸ As the incident expands, the ability for a single Incident Commander to collect and process all of the information essential to developing a high level of situation awareness can easily produce the sensory overload referenced by Diaz.

D. COLLABORATION

Decision making in complex environments requires both a high level of situational knowledge, information sharing, and collaboration. Collaborative capacity is the collective ability of a networked team to collect, synthesize and prioritize information essential to managing events within the unordered context of the Cynefin Model. During emergency response situations, hastily formed networks often develop in an effort to address problems beyond the scope of a single organization.⁵⁹ The ability to form and leverage collaborative networks reflect both organizational culture and social identity. Networks are built on trust, respect, dependability, relationships, and previously formed inter-organizational association.⁶⁰

The need for collaboration increases as the complexity of decision making and task interdependence increase. The foundation of collaboration is openness, shared purpose, commitment to a common goal, and establishing bi-directional pathways of communication.⁶¹

Partnerships, including multi-agency and public-private coalitions are a growing reality and an adaptive way to face the growing complexity of emerging

⁵⁸ Hintze, *First Responder Problem Solving*, 89.

⁵⁹ Donald P. Moynihan, *Leveraging Collaborative Networks in Infrequent Emergency Situations* (Washington, DC: IBM Center for the Business of Government, 2005). 4.

⁶⁰ Nahmod Abdo, The Collaborative Capacity of the NYPD, FDNY, and EMS in New York City: A Focus on the First Line Officer. 39.

⁶¹ Susan P. Hocevar, Gail F. Thomas, and Erik Jansen, "Building Collaborative Capacity: An Innovative Strategy for Homeland Security Preparedness," in *Advances in Interdisciplinary Studies of Work Teams*, eds. Michael M. Beyerlein, Susan T. Beyerlein and Frances A. Kennedy, Vol. 12, Emerald Group Publishing Limited, 2006), 255–274. 3, 6.

threats.⁶² Public managers frequently find themselves operating in multi-organizational environments as a means to solve problems that cannot be solved by a single organization.⁶³ In these collaborative environments, conflict should be expected. During the response to asymmetric incidents, the conflict inherent to collaboration needs to be managed and exploited as a means to produce innovative solutions.⁶⁴

The impact of chaotic incidents often spreads over traditional boundaries; when this occurs, a shared responsibility between involved agencies develops. The presence of multiple actors produces an environment of shared risk that serves as a springboard toward innovation. Chaotic events often lead to a greater density of communication and crisis-based cohesion. This cohesion serves to suspend conflict in the interest of meeting shared urgent needs. These linkages can promote trust that may lead to new collaborative initiatives. As relationships develop, social capital accumulates in increased respect, trust information exchange, and mutual understanding contribute to collaborative capacity and creates a unique window of opportunity.⁶⁵ Reciprocal trust is developed through a sense of mutual respect, which is built by experience over time. Effective collaborators focus on the shared vision of the team and the concept of “we” as opposed to the self-serving interest of “I.”⁶⁶

Hocevar, Thomas, and Jansen claim that the personal aspects of collaboration should not be underestimated. Often collaboration is attained through a personal touch, handshake and a smile.⁶⁷ Focusing on relationships, the literature agrees that interdependence creates a shared purpose and the

⁶² Robert Klitgaard and Gregory F. Treverton, *Assessing Partnerships: New Forms of Collaboration* (Washington, DC: IBM Endowment for The Business of Government, 2003).

⁶³ Rosemary O’Leary and Lisa B. Bingham, *A Manager’s Guide to Resolving Conflicts in Collaborative Networks* (Washington, DC: IBM Center for the Business of Government, 2007).

⁶⁴ Jeff Weiss and Jonathan Hughes, “Want Collaboration? Accept-and Actively Manage-Conflict,” *Harvard Business Review* 83, no. 3 (March 2005), 93–101.

⁶⁵ Hocevar et al., *Building Collaborative Capacity*, 14.

⁶⁶ Nahmod, *The Collaborative Capacity*, 17.

⁶⁷ Hocevar et al., *Building Collaborative Capacity*, 17.

determination of a joint mission. Working as a team creates an environment that supports intelligent improvisation, which may lead to new strategic options and solutions.

As an example of the power of relationships and trust, a significant portion of the response to the Pentagon disaster on September 11, 2001 was attributed to the willingness of the Arlington Fire Department to make the effort to communicate with other agencies prior to the incident and support joint preplanning activities.⁶⁸ During the response to this disaster, the command structure continued to build emergent relationships and foster a collaborative and flexible organizational structure. This adaptability set the stage for the development of an improvised and creative response that addressed unfamiliar problems. This open and inclusive response leveraged nontraditional external resources and personnel in the interest of producing the best possible level of coordination.⁶⁹

Group communication and information sharing remains a problem identified within the literature. Often the environment of emergency response requires the connection of several decentralized actors.⁷⁰ Technology provides a potential mechanism to connect decentralized actors and allow collaboration necessary to take advantage of collective intelligence and complementary skill.⁷¹

E. GEOSPATIAL TECHNOLOGY

Crisis events are highly dynamic and are unpredictable in terms of time and resource needs.⁷² Geo-collaborative technology integrates geographic information systems with resource management databases to produce interactive

⁶⁸ Harrauld, *Inter-Organizational Response*, 19.

⁶⁹ Harrauld, *Inter-Organizational Response*, 20.

⁷⁰ Guoray Cai, "Extending Distributed GIS to Support Geo-Collaborative Crisis Management," *Annals of GIS* 11, no. 1 (June 2005), 4–14.

⁷¹ *Ibid.*, 3

⁷² Guoray Cai et al., "Human-GIS Interaction Issues in Crisis Response," *International Journal of Risk Assessment and Management* 6, no. 4/5/6 (2006), 388–407.

technology that can support decision making. This technology serves as a tool to promote shared situational analysis, build a common vision, filter information, and facilitate effective decision making in the emergency response environment.

The development of interactive technologies associated with Web 2.0, creates the opportunity for remote collaboration and real time three-dimensional emergency response applications in micro-spatial environments.⁷³ Mobile computing is an aid for command and communication that can provide decision support by promoting the consistency of interaction.⁷⁴ As too much information is just as harmful as too little information, geospatial technologies can vastly increase both information flow and situational analysis.⁷⁵ Mobile computing can serve as tremendous aid for both command and communication; this technology is designed to promote the consistency of interaction.⁷⁶

Caution needs to be exercised; as technology can unleash vast quantities of information. There is little doubt that too much information can be just as harmful as too little information.⁷⁷ Often issues involving technology are not technical but involve business processes and adaptive aspects of how humans interact with these capabilities. Currently many geographic information systems (GIS) can add definition and perception to a problem. Often this technology is hard to use and fails to address immediacy and the other special needs of crisis managers who often work in teams that share information, knowledge and judgment while making decisions under stress.⁷⁸ Researchers note that the use of technology in collaborative crisis environments has not been fully explored.

⁷³ Mei-Po Kwan and Jiyeong Lee, "Emergency Response After 9/11: The Potential of Real-Time 3D GIS for Quick Emergency Response in Micro-Spatial Environments," *Computers, Environment and Urban Systems* 29, no. 2 (2005), 93–113.

⁷⁴ Bradley J. Betts et al., *Improving Situational Awareness for First Responders Via Mobile Computing* (Moffett Field, CA: National Aeronautics and Space Administration, Ames Research Center, 2005).

⁷⁵ Ibid.

⁷⁶ Ibid.

⁷⁷ Ibid.

⁷⁸ Cai et al., *Human-GIS Interaction Issues in Crisis Response*, 388–407.

Cai, an expert on geospatial technology, summarizes that challenges with GIS include immediacy, availability, and sharing of information. GIS offers great potential, as much of the data underpinning critical decisions is geospatial in nature.⁷⁹ Managers need robust tools to integrate information about fast developing situations that occur in a geospatial context.

Visual display of information encourages broad participation, as maps encode spatial relationships and enable shared understanding. Maps can be objects of collaboration and support both dialogue and common work.⁸⁰

GIS is not typically designed to represent dynamic phenomena and little research has been completed in this area, despite the consequences of making critical decisions with less than complete information.⁸¹ GIS offers a synthesized model for improved decision making to minimize disasters. Geographic information systems organize data into layers that can be integrated, or removed, based on the specific needs of the user(s). These layers provide an efficient tool to filter information and dissect problems. However, the availability of GIS based education and access to Geocollaborative technology remain barriers to the wide spread adoption of this technology. Future research needs to focus on human adoption, education, and the integration of existing data. This is a particularly important research need, as a lack of integration can cause emergency managers to quickly revert to the use of paper maps.

Geocollaborative crisis management, the ability to use geographic job aids to assist in the management of emergencies is in its infancy, and it faces the challenges of both role definition and the lack of existing models. Currently GIS does not support a wide variety of crisis management applications that allow input from several remote locations. The increasing need for mobile solutions is driven by the need to develop a common operating picture through shared

⁷⁹ Cai et al., *Human-GIS Interaction Issues in Crisis Response*, 388–407.

⁸⁰ Cai, *Extending Distributed GIS*, 8.

⁸¹ John Radke et al., *Challenges for GIS in Emergency Preparedness and Response* (Redlands, CA: Environmental Systems Research Institute, 2000).

intelligence. Computer supported cooperative work suggests that GIS is poised to provide the benefit of a collaboratively developed information platform. This platform has the potential to enhance operational effectiveness, as it reduces the need to share data on an individual basis.⁸² Web 2.0 applications are positioned to meet many of the collaborative needs defined above.

F. CONCLUSION

A consistent theme and a surprising level of concurrence exists throughout the body of research pertaining to the importance of situational analysis. Reviewing the literature, the five common themes listed below emerged:

1. Situational awareness is directly related to the quality of communication flow.
2. The ability to filter information to form a coherent mental picture is essential.
3. Situational awareness and collaborative information sharing are fundamental to developing a shared understanding of the mission or problem.
4. Using imagery or graphical display to summarize information is an opportunity to improve situational awareness.
5. Experienced fire officers who are considered to be experts in their field may become novices when faced with the chaotic, complex and unfamiliar surge incident.

Literature in the area of command decision making links to information flow, situational awareness, collaboration, and the utilization of technology. The literature pertaining to the scope of this research has broad agreement on the importance of situational awareness, collaboration, and the use of technology to aid in decision making. Research within the area of command decision making has produced complimentary models that build upon previous contributions.

⁸² Cai, *Extending Distributed GIS*, 4.

Although research on command decision making has produced valuable results that have shaped advancements in this specialized discipline, the depth of research could be expanded.

A review of the literature reveals that four research gaps exist, and the opportunity to focus on transitional aspects of command remains underexplored. The areas of opportunity are listed below:

1. Evaluation of interdisciplinary approaches to management of resources during chaotic events in an effort to develop multidiscipline best practices.
2. Identification of the social aspects that impact command decision making.
3. Research on the transition of incidents from complex to chaotic contexts.
4. Research concerning the potential for individuals to transition from being experts when facing complex, but previously experienced events, to novices when facing chaotic and unimagined events.

THIS PAGE INTENTIONALLY LEFT BLANK

III. CONSIDERING THE GERMAN PERSPECTIVE TO INCIDENT MANAGEMENT

A. INTRODUCTION

The purpose of this research is to assist Incident Commanders and enhance decision making. This thesis is centered on the need to consider adaptive decision-making methodologies beyond the structure of NIMS particularly in situations of high complexity and uncertainty. As such, including a comparative analysis with an alternative IMS offers the potential to identify best practices and sow the seeds of innovation.

This chapter presents a comparative analysis between NIMS, which is the command system utilized in the United States, and regulation DV 100, also known as Dienstvorschrift 100 entitled *Leadership and Command in Emergency Operations* that was authorized by the German Board of Firefighting Affairs.⁸³ Based on a combination of history, culture, and experience, Germany and the United States use different methods to approach incident management. Although both Germany and the United States utilize incident command to structure operations, significant differences in the application of this principle exist.

Comparatively, Germany consists of 137,847 square miles while the United States consists of 3,717,813 square miles. Germany has 81,799,600 residents while the United States hosts a population of 311,591,917. When considering the impact on a comparative analysis of fire services, land area and population clearly matter. Based on this analysis, Germany has approximately 1/30th of the relative land area and 25 percent of the relative population to protect.

The Federalist principles that form the backbone of the United States governance system ensure that the responsibility to provide public safety

⁸³ Führung und Leitung im Einsatz - Führungssystem. "Leadership and Command in Emergency Operations." *DV 100*. 12 20, 2007. 43.

predominantly rests with each local political subdivision.⁸⁴ As a result, American Fire Service agencies operate by political subdivisions and have little involvement with their respective parent states. Presently, more than 30,625 fire departments⁸⁵ exist within the United States, and this compares to 102 fire departments that exist within Germany.⁸⁶

The German Fire Service was born in a wartime culture and formed through the necessity to confront the threat of fire on a national level. This suggests that a more militaristic and centralized approach to providing fire services exists within Germany. This conclusion is supported by the responsibility to provide public safety residing with each German State.

Staffing for fire protection for both countries follows a similar model utilizing a mix of career and volunteer personnel. Volunteer firefighters make up 80 percent⁸⁷ of personnel in Germany and 72 percent of the fire service in the United States.⁸⁸ Germany has ingrained a culture of volunteerism into its citizens, and certain volunteer activities can offer an alternative to military service.⁸⁹ This produces a strong pool of volunteers and reflects a high level of nationalism. Although volunteer firefighters are part of the fabric of America, volunteerism has decreased and many agencies struggle to find sufficient personnel.

The role of the fire service varies between the United States and Germany. In the United States, the role of the fire service has expanded to meet the needs of each individual community. As an example, 59 percent of fire

⁸⁴ National Fire Protection Association. *U.S. Fire Department Profile Through 2006*. Demographic Profile, National Fire Protection Association, 2006, 26.

⁸⁵ Ibid.

⁸⁶ Interschutz. *INTERSCHUTZ - Germany's Fire Departments*. www.interschutz.de (accessed June 4, 2012).

⁸⁷ Domres B, Schauwecker HH, Rohrmann K, Roller G, Maier GW and Manger A. "The German Approach to Emergency and Disaster Management." *National Center for Biotechnology Information*. 2000. www.ncbi.nlm.nih.gov/pubmed/11117024 (accessed May 3, 2012).

⁸⁸ National Fire Protection Association, *U.S. Fire Department Profile*, 26.

⁸⁹ Domres et al., *The German Approach*.

service agencies in the United States provide Emergency Medical Services.⁹⁰ In Germany, although there is inter-agency cooperation, the provision of medical care is considered a separate discipline. Contrary to the experience of the United States, Germany has a strong relationship of public and private (NGOs) as the majority of disaster relief is accomplished by these organizations.

The purpose of this chapter is to provide an overview of the incident management methods utilized by each country in the hope that best practices can be identified and potentially implemented.⁹¹ It also offers a view of the internal workings of two diverse fire service cultures. In addition to the knowledge that can be extracted through this analysis, this analysis was utilized to inform the development of questions for the Round Three Delphi survey which is presented in Chapter VI.

B. INCIDENT MANAGEMENT

The control of emergency situations uses an incident command system to organize response. Crisis policies have developed on the unique experience of

⁹⁰ National Fire Protection Association, *U.S. Fire Department Profile*, 26.

⁹¹ Governance, law and policy differ between the United States and Germany. The **United States** is a federal constitutional republic, in which the President of the United States (the head of state and head of government), Congress, and judiciary share powers reserved to the national government, and the federal government shares sovereignty with the state governments. The federal entity created by the U.S. Constitution is the dominant feature of the American governmental system. However, most people are also subject to a state government, and all are subject to various units of local government. The latter include counties, municipalities, and special districts. This multiplicity of jurisdictions reflects the country's history. The federal government was created by the states, which as colonies were established separately and governed themselves independently of the others. Units of local government were created by the colonies to efficiently carry out various state functions. As the country expanded, it admitted new states modeled on the existing ones.

Germany is a federal parliamentary republic, based on representative democracy. The Chancellor is the head of government, while the President of Germany is the head of state, which is a ceremonial role with substantial reserve powers. Executive power is vested in the Federal Cabinet (*Bundesregierung*), and federal legislative power is vested in the Bundestag (the parliament of Germany) and the Bundesrat (the representative body of the Länder, Germany's regional states). The political system is laid out in the 1949 constitution, the *Grundgesetz* (Basic Law), which remained in effect with minor amendments after 1990's German reunification. The constitution emphasizes the protection of individual liberty in an extensive catalogue of human rights and divides powers both between the federal and state levels and between the legislative, executive, and judicial branches.

each country and the emergence of different threats that can be identified to explain policy divergence.⁹² As an example, Germany's crisis policy reflects the experience of enduring the wrath of two world wars that occurred on German soil within the last century. Although the United States has been immune from the consequences of large-scale war, we have endured the emergence of the challenges associated with the impact of the attacks that occurred on September 11, 2001.

Disasters consist of situations that are large scale, costly, unexpected, and disruptive. Often these crises can be of such magnitude that even the most robust organizations are challenged or overwhelmed. During these situations, the challenge is focused on system integration at the user interface level.⁹³

In the United States, the *National Incident Management System* (NIMS) was adopted as the single multidisciplinary system to provide a coordinated and centralized system of direction during times of crisis.⁹⁴ Although many agencies were reluctant to adopt this concept, and shortcomings exist in adaptability, the use of this system has become a standard protocol for U.S. fire services.⁹⁵ In practice, NIMS is a command and control system that operates effectively when homogenous organizations with similar goals are integrated into a single organization. This homogenous orientation has produced a closed system where the local Incident Commander typically maintains operational control and facilitates decision making.⁹⁶

⁹² Bahadır Sahin, Naim Kapucu and Ali Unlu. "Perspectives on Crisis Management in European Union Countries: United Kingdom, Spain and Germany." *European Journal of Economic and Political Studies* (Faith University), 2008: 17–39.

⁹³ Paulheim Heiko, Sebastian Doweling, Karen Tso-sutter, Florian Probst and Thomas Ziegert. "Improving Usability of Integrated Emergency Response Systems: The SoKNOS Approach."

⁹⁴ United States Department of Homeland Security. "National Incident Management System." *Federal Emergency management Agency*. December 2008. fema.gov/nims (accessed May 2, 2012).

⁹⁵ John R. Harrauld, "Agility and Discipline: Critical Success Factors for Disaster Response." *The Annals of the American Academy of Political and Social Science* 604, no. 1 (March, 2006): 263.

⁹⁶ *Ibid.*, 263–264.

In Germany, regulation DV 100 also known as Dienstvorschrift 100 entitled *Leadership and Command in Emergency Operations* was authorized by the Board of Firefighting Affairs.⁹⁷ This regulation, developed in accordance with the German Federal Constitution, places the responsibility for emergency response on the 16 German States and defines the command and control system that is utilized within Germany. DV100 was implemented in 1999 and was then adopted by other national organizations, such as the Federal Agency for Technical Relief (German Red Cross). It has evolved into the single system utilized in Germany for the purposes of incident control.

The goal of both the German and United States command and control system is to act swiftly and appropriately to generate uniformity and consistency and implement complex and technical measures during emergency situations. A comparison of the 26 page DV 100 and the 170 page United States National Incident Management System (NIMS) reveals several remarkable similarities and some stark differences.

In Germany, Regulation DV 100 established the staff system and identified six unique functions. NIMS identified four staff functions, which are significantly different from those presented within DV100. Despite these differences, both use an organized approach first developed by Napoleon, based on specified staff functions within command and control systems.⁹⁸

A comparative analysis of these systems indicates that there are several common issues and challenges that are faced collectively by both DV100 and NIMS. These common challenges include the ability to maintain the motivation, competence and confidence of personnel given the relatively infrequent occurrence of large-scale disasters.⁹⁹ Often this produces a lack of capability, as

⁹⁷ Führung und Leitung im Einsatz - Führungssystem. "Leadership and Command in Emergency Operations." *DV 100*. 12 20, 2007. 43.

⁹⁸ Susanne Klatt, "Staffing and Training of the Essen Fire Department Incident Management Team." Executive Fire Officer Program, United States Fire Administration, Emmitsburg, MD, 2010. 7.

⁹⁹ Ibid., 7.

personnel are unfamiliar and uncomfortable with these critical roles. The need for collaboration and technical information sharing systems or job aids is a challenge that has been reported by users of both NIMS and DV100. This suggests a need for technology and job aides that can improve sustainability, and interaction.¹⁰⁰

Another commonality is that both systems evolved from fire service roots to an all hazards platform. NIMS and DV 100 are staff function based and rely on motivated staff as a key to success. Neither system seeks to micromanage operations and both allow tactical crews with the operational flexibility necessary to achieve mission goals. Other similarities include the recognition of the value of social relationships to assist in collaboration and the need to involve senior elected officials in disaster response.¹⁰¹

In contrast to the similarities noted above, DV 100 offers a strikingly humanistic approach that concentrates on the value of personnel, relationships, confidence, and the impact of “command attitude.”¹⁰² Although NIMS provides structure as detailed below, the German Command Chart extends beyond structure to address both process and means. DV 100 looks beyond the structure of command and control and focuses on both strategy or processes (defined as process (procedures) in Figure 2) and tactics (presented as means (equipment)). In contrast, the NIMS model solely emphasizes structure and the subsidiary functions of Operations, Planning and Finance. These differences are illustrated in Figures 2 and 3.¹⁰³

¹⁰⁰ Heiko Paulheim, Sebastian Doweling, Karen Tso-sutter, Florian Probst, and Thomas Ziegert. "Improving Usability of Integrated Emergency Response Systems: The SoKNOS Approach.

¹⁰¹ Donald Bliss, Personal communication with the author, June 4, 2012.

¹⁰² Führung und Leitung im Einsatz - Führungssystem. Führung und Leitung im Einsatz - Führungssystem. *Leadership and Command*, 43.

¹⁰³ Ibid.

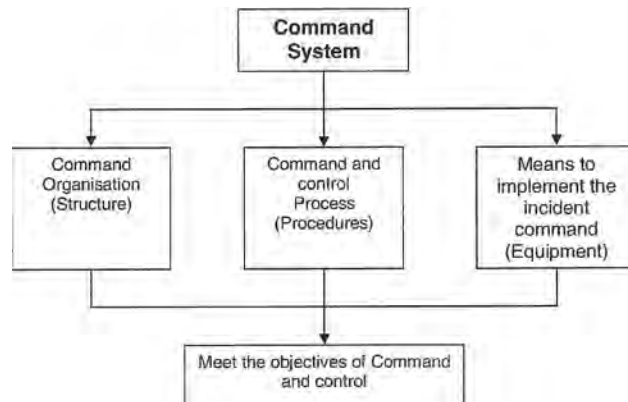


Figure 2. German Command Chart (From DV 100)



Figure 3. NIMS Based Command Chart (NIMS)

The humanistic approach of DV 100 also emphasizes the influence of leadership and the need to employ a situational style that promotes collaboration, confidence and motivation.¹⁰⁴ DV 100 is also different from NIMS in that it indicates that the process of incident control is a circular system that emphasizes the need for information and situational analysis as a precursor to effective decision making.¹⁰⁵ This circular mission process is detailed within Figure 4. Although an IC using NIMS will employ situational analysis to make sense of a situation, NIMS subordinates the value of information in favor of the command and control structure. The inherent focus of DV 100 on the importance of

¹⁰⁴ Führung und Leitung im Einsatz - Führungssystem. Führung und Leitung im Einsatz - Führungssystem. *Leadership and Command*.

¹⁰⁵ Ibid.

situational analysis is one of the larger differences observed by people who are familiar with the use of both of these command systems.¹⁰⁶

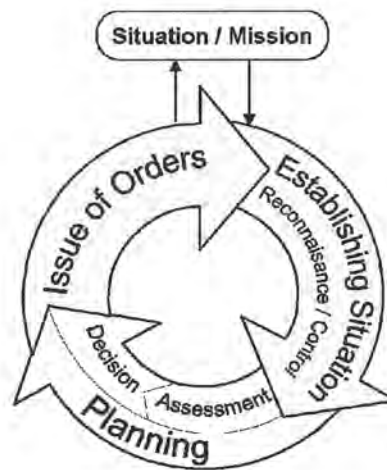


Figure 4. German Circular Mission Process (From DV 100)

American IC often relies on the use of experience and the early recognition of patterns and cues as a guide to action. DV 100 answers that the use of experience is a mistake, as it promotes reliance on the past and leaves the Incident Commander with few options when unfamiliar situations emerge.¹⁰⁷

In America, command most often falls to the local agency or a unified group of involved agencies. This fails to recognize the need for the automatic deployment of incident support. Germany utilizes a three-person command team called a “zug” to provide the first line of command support.¹⁰⁸ This concept provides support to the local IC and links a command team to the resources of a command centre. The organization of a “zug” is presented in Figure 5. DV 100 recognizes the need for both on-site and off-site support. Reflecting a more nationalistic focus, command teams are prestructured into teams of three to nine

¹⁰⁶ Bliss, *Personal communication*.

¹⁰⁷ Führung und Leitung im Einsatz - Führungssystem. Führung und Leitung im Einsatz - Führungssystem. *Leadership and Command*.

¹⁰⁸ Ibid.

personnel that automatically respond as incidents escalate.¹⁰⁹ American ICS lacks both the recognition of the need for this level of command support and automation of this process.

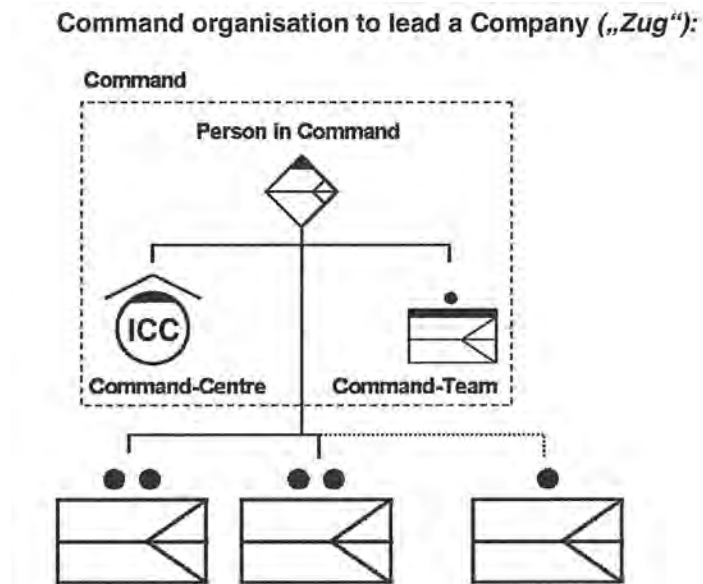


Figure 5. German Command Team Structure to control a company “Zug” (From DV 100)

Although both systems rely on staff functions as the basis of command and control, these staff functions differ dramatically between the United States and Germany. In the United States, staff functions include Operations, Planning, Logistics and Finance. These positions are augmented by Command Liaisons, Safety Officers, and Public Information Officers. The German approach includes six staff functions that include; personnel and administration, information gathering and assessment, operations, logistics, media and press, and communications and transmission. DV 100 also demonstrates the inclusion of experts and nongovernmental organizations (NGOs), such as representatives of agencies involved in the incident. The staff functions outlined in DV 100 are detailed in Figure 6. When compared to NIMS, DV 100 provides three unique

¹⁰⁹ Führung und Leitung im Einsatz - Führungssystem. Führung und Leitung im Einsatz - Führungssystem. *Leadership and Command*.

staff functions that are not contained within NIMS. As an example of these divergent staff functions, the NIMS based finance section is not included in the German system, and the staff function of personnel and administration is not included within the scope of NIMS. Another difference highlighted by the staff functions contained within DV 100 is the importance of information gathering and assessment, and a focus on personnel and communications; neither of these are included as staff functions within NIMS.¹¹⁰ These three areas of divergence illustrate potential opportunities that the United States could utilize to enhance command operations.

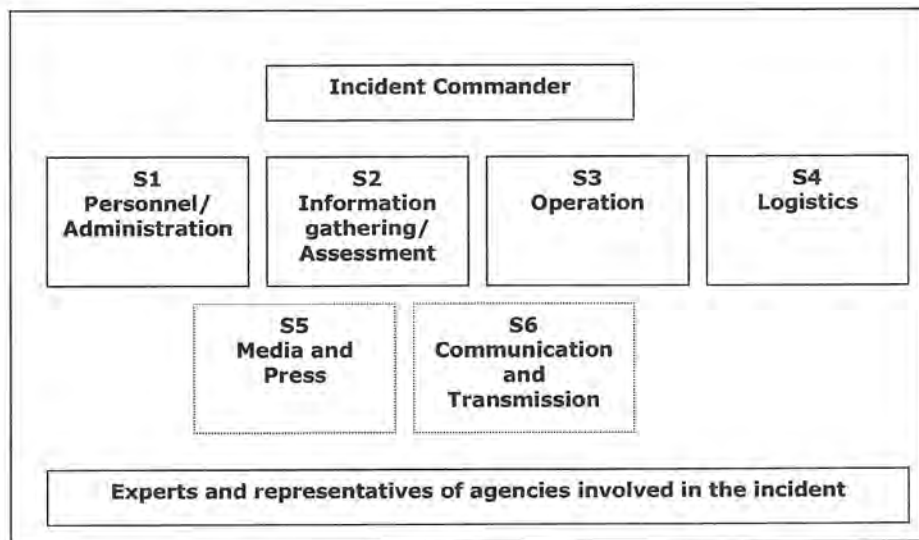


Figure 6. German Command Staff Functions (From DV 100)

DV100 creates an environment open to innovation and encourages the involvement of experts and nongovernment agency partnerships. As an example of the strong public/private partnership, German NGOs, such as the Workers Samaritan Association, are responsible for aspects of disaster relief. In addition, the German command and control philosophy places a strong emphasis on both training and qualification. Often a bachelor's degree is required and 24 months of

¹¹⁰ Führung und Leitung im Einsatz - Führungssystem. Führung und Leitung im Einsatz - Führungssystem. *Leadership and Command*.

training promote operational competence.¹¹¹ This level of required educational qualification is not often seen in the United States. This German focus on education carries through to the training expectations of command staff, as personnel are developed to be specialists within defined roles.

The potential value that could be extracted by exporting some principles of DV 100 can best be found through examining the observations of experts that are familiar with both systems. In an effort to obtain a comparative perspective and provide evidence that these principles in both systems could create operational value, former New Hampshire State Fire Marshal and International Fire Service Consultant Don Bliss was contacted. Marshal Bliss has done extensive work with the German Fire Service and has served as a Fire Chief in several New England Communities. This cumulative experience provides a unique perspective that validates several points outlined within this analysis. In an interview on June 4, 2012, Marshal Bliss indicated that he believed the United States could benefit from implementing many of the principles contained in DV 100.

Specifically, Marshal Bliss noted,

Operations produced through the use of DV100 tend to create more consistent and precise practices than are typical under incident command within the United States. The German system utilizes a military model that emphasizes education; advancement is based on training provided in a officer candidate school, and in many cases an officer would be well trained but may not have previously been a firefighter.¹¹²

Advancement based strictly on education is contrary to the fire service culture that exists within the United States. Marshal Bliss also noted that “NIMS

¹¹¹ Klatt. *Staffing and Training*.

¹¹² Bliss. *Personal communication*.

based systems can be compromised as the Incident Commander is often tasked with performing multiple functions that include requesting the resources necessary for the response.”¹¹³

The comparative analysis detailed in the previous narrative, and within Table 1, provides an overview of divergence. These differences should be analyzed and evaluated to determine best practices, and the potential value of exporting these practices. Specifically, Germany could benefit from increased information sharing while the United States could benefit from moving past the rigidity of NIMS to a system more open to partnerships and a humanistic approach. Table 1 illustrates aspects of the two incident control methodologies:

Table 1. Delphi Observations Improvising and Adapting ICS

Country	United States	Germany
Command System	National Incident Management System (NIMS)	Dienstvorschrift 100
Challenges	Frequency of Use Confidence of command staff to fill high stress roles during surge events.	Frequency of Use Confidence of command staff to fill high stress roles during surge events.
Collaboration	Emphasis on Incident Commander	Emphasis on support and collaboration
Humanistic Approach	Structural Emphasis	Emphasis on personnel Command Attitude Confidence and motivation Situational Style
Experience Based Decision making	Emphasis on patterns and cues	Viewed as a negative trap that if utilized can create paralysis in abnormal situations
Staff Focus	Operations Logistics Finance	Information analysis Personnel Communications
NGO Partnerships	Afterthought not viewed as a primary role	Open to experts and NGOs NGOs perform 80 percent of disaster relief work
Country	United States	Germany
Training	Sporadic and moderate in duration	Bachelors required 24 months for competence Specialization in staff functions
Role Definition	Expansive, Generalist	Compartmentalized Specialist

¹¹³ Bliss, Personal communication.

Incident control challenges both countries, and Germany could learn from the United States in terms of increasing information sharing between role divergent agencies, and recognizing that experience does have some value when facing the challenges of emergency response. As noted previously, Germany and the United States are divergent within governance, law and policy related to incident control. Divergence in crisis policy and incident control philosophy is a product of the evolution, threat experience and culture inherent to each country. Considering the German approach, the United States has the opportunity to move past the structure and rigidity presently in place. This comparative analysis is important to the IC in that it provides exposure to concepts integrated into a foreign IMS system. The ten ideas listed below are concepts that have been extracted from DV 100 and then submitted to the Delphi panel as a Round Three question that evaluated the potential value of integrating these concepts into NIMS:

1. Development of partnerships with nontraditional organizations, such as NGOs and including both private corporations and clubs. As an example, partnerships with private corporations such as Home Depot or Walmart can provide supplies needed during the response to surge events;
2. Development of a communications and transmission staff function;
3. Development of a personnel and administration staff function;
4. Development of an information gathering and assessment staff function;
5. Development of computer-based command checklists;
6. Move the command post to a fixed, off-site facility;
7. Provide less structure and allow more creativity;
8. Promote the automated response of incident support teams;

9. Development of situational analysis teams (dedicated personnel that focus on gathering and verifying information for the IC);
10. Development of regional support teams.

C. CONCLUSION

This comparative analysis is utilized to distill ten concepts from DV 100 that may enhance NIMS, if adopted in the United States. These ideas were utilized to inform the development of questions in the Round Three Delphi survey, which is presented in Chapter V. One theme consistently observed during this research process was the dedication of personnel and focus on mission that existed within each Country.

The implementation of these concepts should be a subject of further research. Although these unique aspects of DV100 have the potential to inspire increased collaboration and greater effectiveness during the response to nonroutine surge events, additional evaluation is required to establish how these concepts would integrate within the NIMS IMS system. Consideration should be given to what second and third order effects would develop should these practices be introduced as a component of American NIMS.

The majority of the potential innovations derived from DV 100 would have to be developed and integrated into operations on a regional level. This is a particularly difficult task as the federalist principles of American governance place authority at the local level. Regional collaborative groups typically consist of informal professional associations that link multiple jurisdictions. Ultimately, these regional groups promote shared goals that emerge through a consensus process.

The political environment of these regional entities produce an environment where personalities, social relationships, and the need for consensus dominate over more formal organizational power structures that exist on the local level. Although informal, these regional fire service associations are

brought together by the emergence of shared values and the desire to create a synergy in which the group can accomplish more through collaboration than a single agency could accomplish on its own. As members of these groups often work together during emergency response, a shared interdependence is created. Thus, regional associations may already demonstrate some of the more humanistically-based approaches that are key aspects of the foundation of DV 100.

As change is often a difficult process, strategic implementation will need to focus on collaboration. The literature presented in Chapter II agrees that interdependence creates a shared purpose and the determination of a joint mission. Working as a team creates an environment that supports intelligent improvisation, which may lead to the development of new strategic options and solutions necessary to mitigate nonroutine surge events.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. METHODS AND RESULTS—DELPHI ROUND ONE SURVEY

A. INTRODUCTION

The objective of this thesis is to provide tangible guidance that can help Incident Commanders optimize decision making during the initial hours of the response to surge incidents.¹¹⁴ This chapter describes the research method utilized to gather and analyze data for the two research questions that listed below:

- 1. As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate that a different method of decision making is necessary?**
- 2. What strategies can be utilized to enhance decision making during the initial response to chaotic surge incidents?**

The literature review indicates that as surge incidents become unpredictable, unfamiliar and chaotic, Incident Commanders can become overwhelmed. During these asymmetric events, signals predict the transformation into the chaotic context of the Cynefin Framework¹¹⁵. As events transition, decision-making methodologies, beyond the closed system of incident command, need to be considered in an effort to produce optimal results.

The literature review presented in Chapter II is used to inform questions that were incorporated into a three-round Delphi survey that was distributed to National Fire Academy (NFA), Executive Fire Officer Program (EFOP) Graduates or CFOs that participate in the Massachusetts Fire Incident Reporting System (MFIRS). Based on the prerequisites defined above, survey participants are

¹¹⁴ Surge events can be defined as emergency incidents that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism related events.

¹¹⁵ Snowden, *A Leaders Framework*, 68–76.

considered subject matter experts. The responses to the first round of the Delphi survey are analyzed and coded for themes that are delineated and interpreted in this chapter.

B. DELPHI METHOD

The Delphi survey method was developed by Rand Corporation in the 1950s as a tool for knowledge building.¹¹⁶ The Delphi technique is a systematic, interactive forecasting method that facilitates a panel of geographically dispersed experts to support judgmental and heuristic decision making when a lack of agreement or an incomplete state of knowledge exists.¹¹⁷ Based on the principle that forecasts from a structured group of experts, they are more accurate than data obtained from unstructured groups or individuals.

A Delphi survey process harnesses the subject matter expertise of selected participants to deal systematically with a complex problem or task.¹¹⁸ This method is selected based on the opportunity to work with expert fire service leaders to identify tangible solutions to a complex problem faced exclusively by emergency response practitioners. This technique provided the benefits of anonymity, iteration, controlled feedback, and statistical aggregation.

During a Delphi process, a first round survey is formulated and distributed. After the first round survey is closed, the response is summarized and utilized to construct the second round survey. This process is repeated during subsequent rounds and provides participants the opportunity to reflect on the comprehensive feedback of the whole group.¹¹⁹ The Delphi process consists of two distinct phases. The first phase is the exploration stage where the subject is fully

¹¹⁶ Michael Adler and Erio Ziglio. *Gazing into the Oracle: The Delphi Method and its Application to Social Policy and Public Health*. London: Jessica Kingsley Publishers, 1996. 5.

¹¹⁷ Harold A. Linstone and Murray Turoff. *The Delphi Method: Techniques and Applications*. Vol. 18. Reading, MA: Addison-Wesley Pub. 1976.

¹¹⁸ Ibid.

¹¹⁹ Adler, *Gazing into the Oracle*, 9.

discussed. The second phase is the evaluation stage, which is used to gather expert thoughts and perceptions on various ways to address the issues under investigation.¹²⁰

C. DEMOGRAPHICS AND SELECTION CRITERIA

Candidates selected were seasoned, and CFOs (between the age of 35 and 65) that have demonstrated experience in the response to surge incidents. The initial selection of participants is based on completion of the National Fire Academies EFOP or participation in the MFIRS. These professionals are regarded as experienced experts within the field of emergency response.

It should be noted that candidates needed to be members of the American Fire Service but were not constrained from participation by a specific agency affiliation. The majority of the participants were located within New England. However, in an effort to provide balance, three participants were specifically recruited from other regions of the Country. All survey respondents were polled only on technical input on research questions. All questions addressed areas of expertise not opinion.

The survey was sent to a group of 32 CFOs, as defined above. The respondents were polled using an online survey tool. Initially phone calls were placed to potential participants, if these professionals agreed to participate in the survey process, an introductory email was sent on May 6, 2012, to provide context, assign a coded control number and confirm agreement to participate in the process. On May 7, 2012, the confirmation email was followed by the actual link to the First Round Survey and the request to complete it within two weeks. The confirmation email is found in Appendix B. The response rate was initially moderate, so two reminder emails were sent over the final week of the survey period. The survey was closed on May 22, 2012, two weeks after being distributed. Thirty of the thirty-two potential participants (94 percent) responded.

¹²⁰ Adler, *Gazing into the Oracle*, 9.

D. DELPHI SURVEY ROUND ONE: INSTRUMENTATION

Questions for Round One of the Delphi survey were formulated based on both on the themes identified within the literature review, as presented in Chapter II. As the survey was drafted, it was piloted tested with several experienced CFOs from outside of the sample to clarify the intent and wording of the questions in the survey. The pilot process resulted in light editing of the questions in the survey. The first round questions were framed to identify signals that indicate that an emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar, or chaotic.

The first round consisted of ten quantitative and qualitative questions. This included three demographic question and seven questions that addressed the two broad categories of: (1) identification of signals, (2) adaption of decision-making methodologies. Qualitative questions allowed the respondents to provide specific examples of their perceptions, observations and strategic adaptations to surge events. Six questions focused on the identification of the signals of incident transformation. The final two questions addressed the need for strategic adaption of decision-making processes based on the presence and or absence of the signals identified by the respondents.

The survey was implemented using Survey Monkey, an online survey tool. The questions that were asked in Round One can be found in Appendix C. Example of a demographic question and an open-ended question are contained in Table 2. The first two questions were administrative, reiterating agreement to participate in the survey and asking for the entry of the participant's coded control number. The third and fourth questions queried the level of experience of the participants. The fifth question asked what position within the Incident Command System (ICS) that participants typically fill. Seven open-ended questions followed. The sixth question asked for the signals that an emergency incident is moving beyond the expected and becoming unpredictable, unfamiliar and chaotic. The seventh asked participants to identify benchmarks associated with incident transformation, as detailed above. The next two questions asked

respondents to use their experience to identify signals that an incident was in the process of transition toward the nonroutine. The next two questions asked participants about the absence of signals. The final question addressed whether and how respondents alter decision-making strategies as an incident becomes unfamiliar and unpredictable.

Table 2. Delphi Survey Round One Sample Questions

Demographic and Qualitative Question Examples from the Round One Survey	
Demographic	<p>3. How many years of fire service experience do you have?</p> <ul style="list-style-type: none"> ○ Less than 15 years ○ 15–19 years ○ 20–24 years ○ 25–29 years ○ 30–34 years ○ 35 or more years
Qualitative	<p>1. What are the signals that an emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic?</p> <p>Please list out the factors or signals that you have observed or experienced and provide as much information as possible.</p>

Following the principles of the Delphi method, the results were analyzed and an overview was provided to the respondents, and some of the findings were summarized and used to inform the development of Round Two questions. The results of Round One are presented and discussed below.

E. DELPHI SURVEY ROUND ONE: RESULTS

This section presents each question from Round One and the results obtained. The Round One Survey was focused on identifying signals that indicate

that an emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic. Data were summarized based on themes identified in participant responses.

F. SAMPLE DEMOGRAPHICS

1. Years of Fire Service Experience

Participants were asked to identify their fire service experience. Choices presented were: less than 15 years, 15–19 years, 20–24 years, 25–29 years, 30–34 years and 35 or more years. All of the respondents indicated that they had 15 or more years of service. Overall, 63.4 percent of participants had 30 or more years of fire service experience. The statistical breakdown is detailed in Table 3.

Table 3. Round One Sample -- Years of Fire Service

Years of Service	Response Percentage	Response Count
15–19 Years	3.3%	1
20–24 years	16.7%	5
25–29 years	16.7%	5
30–34 years	36.7%	11
35 or more than years	26.7%	8

Number of respondents = 30

2. Years of Experience as a Command Officer

Participants were asked to select the range of command experience appropriate to their length of service. Choices presented were: less than less than 5 years, 5–9 years, 10–14 years, 15–19 years, 20–24 years and 25 or more years. Overall, 87 percent of respondents have a minimum of 10 years of command experience, and 57 percent have over 15 years of command experience. The breakdown is detailed in Table 4.

Table 4. Round One Sample – Years of Command Experience

Years of Service	Response Percentage	Response Count
Less than 5 years	3.3%	1
5–9 years	10.0%	3
10–14 years	30.0%	9
15–19 years	26.7%	8
20–24 years	13.3%	4
25 or more than years	16.7%	5

Number of respondents = 30

3. Command Position Most Frequently Held

Participants were asked to identify what position within the incident command system they typically fill. Choices presented were: Incident Commander, Operations Section Chief, Safety Officer, Planning Section Chief, Logistics Section Chief, and “other.” Ninety percent of respondents indicated that they typically serve in the role of Incident Commander (IC). One participant selected “other” and indicated that he typically functions as a Branch Manager or agency representative. The statistical breakdown is detailed in Table 5.

Table 5. Round One Sample – Most Frequent Command Position

Position Typically Filled	Response Percentage	Response Count
Incident Commander	90.0%	27
Operations Section Chief	3.3%	1
Safety Officer	3.3%	1
Planning Section Chief	0%	0
Logistics Section Chief	0%	0
Other position	3.3%	1

Number of respondents = 30

G. SIGNS, SYMPTOMS AND IDENTIFICATION OF CHAOTIC INCIDENTS

Questions Six and Seven asked respondents to identify signals and benchmarks that an event was becoming unpredictable, unfamiliar, and chaotic. Based on the similarity of these two questions, the analysis of responses was consolidated. The two questions are listed below:

- 6. What are the signals that an emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic?**
- 7. ICS often uses benchmarks to determine incident progression or mitigation. As an incident unfolds, the situation can become chaotic, what benchmarks tell you that you have reached this point?**

These questions sought to develop an inventory of signals and benchmarks that respondents have experienced during their careers. Participants were asked to identify signals and benchmarks that an emergency is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic. One hundred percent of respondents answered Questions Six and 97.6 percent of respondents answered Question Seven.

Analysis of the responses to these open-ended questions focused on the identification of common themes. . As the data were analyzed, I noted that some of the responses referenced the specifics of the emergency situation. Other responses referred to aspects of the command structure. The final response category focused on aspects that pertained directly to first responders. As the response data were analyzed, 18 themes emerged across both Questions Six and Seven. Themes were sorted by frequency with the most frequent response selected listed at the top of the table. Results are presented in Table 6.

Table 6. Thematic Responses Identifying Signals of Incident Transformation

Themes of Signals and Benchmarks	Frequency of Response
Insufficient resources	26
Strained command structure (lack of structure, unable to manage roles)	19
Lack of progress (situation escalates, unable to complete assignments)	19
Overwhelmed (anxiety, confusion)	15
Lack of sufficient information (situational analysis)	14
Safety compromise (loss of accountability, mayday call, victim or firefighter injury)	12
Managed by incident (reactive nature emerges, abandon SOPs and or preplans)	11
Problems with situation reports (increased or decreased volume observations don't match reports, inadequate content)	11
Loss of responder composure (paralysis, frustration and or errors)	10
Communications strain / breakdown	9
Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, smoke conditions, structural compromise)	9
Time expectations exceeded	8
Multiple decision points/priorities (multiple operational site/incidents)	8
Need to redeploy resources (defensive posture)	6
Lack of teamwork (freelancing)	5
Command inundated with information (external concerns)	4
Sense of urgency (intuition, voice modulation)	3
Complex operations/structure	1

Number of respondents = 30

The variety of participant responses provide insight into how experienced command officers form the perception that events are becoming nonroutine. This information is important, as RPD indicates that decisions are made based

upon patterns and cues as a precursor to decision making.¹²¹ Providing this information to ICs can expand their inventory of cues using RPD. Five themes occurred most frequently:.

- Insufficient resources
- Strained command structure including the inability to manage roles
- Lack of progress in incident stabilization
- Overwhelmed personnel marked by anxiety or confusion within the command staff
- Lack of sufficient information and situational awareness

The most common theme presented was that the lack of sufficient resources. This is not surprising given the scope of response required for surge events, as it is not feasible to have sufficient resources available to address these very rare situations. This means that resources are not immediately available to match the size and scope of the emergency event.

First response agencies across America are geared to confront the typical volume and scope of incidents that frequently occur within the organization's respective jurisdiction. When surge events occur, response extends beyond the capability of a single agency. In these cases, communities rely on mutual aid from adjacent communities. Surge events typically exhaust local mutual aid and require a longer response of distal resources that may not be immediately available. The four quotes below provide a variety of thoughts on this theme:

Based on an assessment of the situation being faced, it is determined that the number of resources at the scene or already en-route will not be sufficient to manage the situation.

The most common benchmark for reaching the "chaotic" point in an event from my experience is when the request or need for resources exceeds the available resources. Decisions have to be made at both the command level and at the tactical level as to what

¹²¹ Klein, *Recognition-Primed*, 139.

missions we can and will respond to and which missions we cannot. My observations of this includes the 911 center advising that requests for services are being stacked up and triaged, and or loss of utilities to key infrastructure, and declarations of a 'local state of emergency.'

Time is against you. Primary resources are near depletion.

What is concerning is when the "normal" chaos becomes something other than that, some of those benchmarks would be: Exhausting all local and regional resources, additional assistance will need to come from further away and will be operating completely out of their "normal" area and that may create some operational issues.

The command structure provides the basis for organization of incident objectives. Frequent indicators that an incident is escalating toward the unexpected include both a strained command structure and personnel that are overwhelmed. Responses indicated that as a surge incident escalates, a lack of adequate command staff can produce an environment in which the Incident Commander is unable to manage or process the multiple decision points that require immediate attention. As first responding crews arrive on the scene of an overwhelming event, pursuing tactical goals at the expense of creating a command structure adversely affects the development of a coordinated plan to mitigate the situation. The following four quotes illustrate this point:

The Incident Commander is unable to manage all of the functions and begins to expand and delegate roles. The signals are that the Incident Commander of designated staff are becoming overwhelmed.

Loss of control, lack of reports and updates, insufficient resource tracking and tasks assigned.

Commanders will abandon efforts to coordinate overall operations and ignore the development of operations that are not in sync.

When personnel lose their control to remain in the command structure, such as radio traffic becoming uncontrollable, units self-deploying, or the IC losing contact with a unit or multiple units. There are also times when a lot of mutual aid is called and the

command structure has not been setup to handle it, this is indicated when the IC becomes barraged by mutual aid officers making suggestions on the operation.

Lack of progress in mitigating an incident represents another common situation that occurs during the evolution of surge incidents. Analysis of the data indicates that failure to make expected progress serves as a frequent warning sign that the event may be more serious than anticipated based on initial observation. The following two quotes illustrate this point:

The incident is escalating much more rapidly than initial responders can take control or mitigation action.

An inability for various assigned/deployed resources to complete their assignments/missions within normal accepted time frames. No discernible progress on incident control/mitigation within several short, normally reasonable operational progress periods, i.e., 15 minutes, 30 minutes, 60 minutes, etc. An ongoing need to quickly deploy resources that you do not have available to critical incident tasks/assignments. A belief that you will be playing "catch up" for an extended period of time and conversely an inability to "get ahead" of the incident.

Command personnel are often overwhelmed by the magnitude and complexity of these rare and unfamiliar situations. Responses indicate that when personnel are overwhelmed, decision making can be compromised by the inability to process information. Although 15 respondents noted that they interpreted personnel being overwhelmed as a clear signal that the incident was becoming unpredictable and chaotic, no specific comments provided tangible examples of this phenomenon.

The lack of situational awareness may mask the scope and intensity of the situation that responders are facing. Information pertaining to an event forms the foundation of action and the basis to make informed decisions. The lack of sufficient information inhibits the ability to fully assess a situation and was perceived by many respondents to be the key situation-based signal that events are moving toward the nonroutine. The following three quotes illustrate the importance of this point:

Accurate information assessment is difficult to obtain.

Unable to get a “complete picture” of the problem. i.e., a lack of information as to what exactly has happened or is happening. No clear picture as to how much worse the incident will get.

Commanders will delay making decisions awaiting more information

Questions Eight and Nine further explore respondent’s experiences in an effort to identify signals that an event that an event is falling out of the ordinary. Based on the similarity of these two questions, the analysis of responses was consolidated. The two questions are listed below:

- 8. Think about your experience responding to a routine single-family residential structure fire. Imagine that the situation is showing signs of becoming nonroutine (falling out of the ordinary). What are the signals that alert you to this transition.**
- 9. Pick a situation that you experienced where a routine event surged into a complex or nonroutine situation. What were the signs of this transformation?**

Question Eight asked participants to use their experience responding to a single-family residential structure fire to identify signals that this incident was becoming nonroutine in the areas of fireground activity, incident progression and personal decision making. Question Nine asked a related question. In addition, respondents were encouraged to identify signals that did not fall within the categories of fire-ground/emergency scene activity, incident progression and personal decision making. Two participants skipped Question Eight and two participants skipped Question Nine. One hundred percent of the participants that answered Question Eight provided inputs into each of the three categories identified and 67.9 percent provided signals they felt were outside of the three categories. Ninety-four point six percent of participants that answered Question Nine provided input into each of the three categories identified and 64.3 percent provided input that did not conform to one of the three categories.

Thematic labels were developed to code responses for both Questions Eight and Nine. Data presented is sorted to show the most frequent themes at the top of the table. A breakdown of this analysis is detailed in Table 7:

Table 7. Responses Identifying Signs of Incident Transformation

Emergency Scene Activity	Incident Progression	Personal Decision making
Lack of progress (situation escalates, unable to complete assignments)	Lack of progress (situation escalates, unable to complete assignments)	Command inundated with information (external concerns)
Overwhelmed (anxiety, confusion)	Time expectations exceeded	Lack of sufficient information (situational analysis)
Problems with situation reports (increased or decreased volume observations don't match reports, inadequate content)	Overwhelmed (anxiety, confusion)	Overwhelmed (anxiety, confusion)
Insufficient resources	Insufficient resources	Multiple decision points/priorities (multiple operational site/incidents)
Sense of urgency (intuition, voice modulation)	Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, smoke conditions, structural compromise)	Sense of urgency (intuition, voice modulation)
Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, smoke conditions, structural compromise)	Strained command structure (lack of structure, unable to manage roles)	Communications strain / breakdown
Safety compromise (loss of accountability, mayday call, victim or firefighter injury)	Command inundated with information (external concerns)	Complex operations/structure
Managed by incident (reactive nature emerges, abandon SOPs and or preplans)	Multiple decision points/priorities (multiple operational site/incidents)	Managed by incident (reactive nature emerges, abandon SOPs and or preplans)
Lack of teamwork (freelancing)		Need to redeploy resources (defensive posture)
Multiple decision points/priorities (multiple operational site/incidents)		High risk decisions (risk based analysis)
Complex operations/structure		Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, smoke conditions, structural compromise)
		Lack of progress (situation escalates, unable to complete assignments)
		Strained command structure (lack of structure, unable to manage roles)

Number of respondents = 28

The variety of participant responses provide insight into how experienced command officers utilize experience to form the perception that events are becoming nonroutine. Several themes have been listed in multiple categories. This overlap indicates that a signal theme can apply to multiple aspects of emergency response. As an example, the theme entitled lack of sufficient resources was noted in all three categories. This indicates that a lack of sufficient resources impacts fireground/emergency scene activity, incident progression and personal decision making. The observations of participants are detailed within each category. The most frequently selected overlapping themes are listed below:

- Lack of progress (situation escalates, unable to complete assignments)
- Overwhelmed (anxiety, confusion)
- Insufficient resources
- Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, smoke conditions, structural compromise)
- Multiple decision points/priorities (multiple operational site/incidents)

All five of these themes were also noted in the analysis of Questions Six and Seven. This indicates a developing consistency in term of the themes presented in this thesis.

1. Fireground / Emergency Scene Activity

The initial response to surge events places insufficient resources against an expansive, unfamiliar and unexpected situation. Often the lack of similar experience creates the potential for the IC to be surprised by unfamiliar and or unexpected occurrences. This environment often overwhelms responders as they try to avoid being managed by the incident and produce a pattern of response actions that allow them to get ahead of the progression of the situation.

In these situations, crews operating on the incident scene and command personnel often become frustrated by the lack of progress they achieve in mitigating the incident. These chaotic events serve as a breeding ground for confusion, as there is often a lack of complete and correct information. Incidents of this magnitude require the IC to face multiple, often opposing, decision points and priorities. This frequently occurs when a situation creates multiple incident or operating sites. As an example, the over pressurization of a natural gas line has the potential to produce fires and leaks at several locations. These challenges can produce an environment in which a lack of direction leads to crews functioning as individual units rather than as a coordinated team. Pertinent responses that illustrate a lack of progress as a signal of a surge event are listed below:

No progress is being made and ICS starts to unravel. Safety is being compromised.

Situation reports from various areas of the incident indicate a deterioration of the situation.

People are overwhelmed and have difficulty making correct decisions toward mitigation, this decreases the safety of personnel.

Confusion in strategies and tactics, offensive and defensive actions occurring simultaneously.

Initial units arriving on scene have difficulty in getting even initial tasks completed effectively.

2. Incident Progression

As surge incidents occur infrequently, the prior experience of first responders is easily exceeded, and members of the command staff are often surprised with the complexity of these unfamiliar situations. Facing the unexpected creates a level of both anxiety and uncertainty as personnel struggle to determine the best actions to confront these unfamiliar situations. During routine events, conditions are expected to improve over time as tactics result in

the mitigation of the situation. Surge events are typically marked by operations that extend over abnormal periods of time without improvement in conditions. Marked by a lack of progress, these incidents produce a complex operating environment that can easily overwhelm command staff. The lack of sufficient resources, coupled with the complexity of what is often a chaotic situation, leads responders to take substantial risk; this can result in a loss of personnel accountability and safety on the incident scene. Illustrative responses are listed below:

Percentage of involvement increasing rather than decreasing.

The incident continuing to grow beyond our prior experiences.

Lack of progress controlling the incident, having to triage and ration our response.

As time progressed, the problem is not being solved. Chain of command asking for additional resources.

Personnel have uncertainty of what is going on.

Living in an area not prone to flooding, the 100 year storm took everyone by surprise.

3. Personal Decision Making

Emergency situations are subject to uncertainty and time pressure and often produce an environment in which multiple decision points require immediate attention. Surge events amplify these pressures and in the absence of familiar patterns and cues can elicit a reactive command structure that is basing decisions on inappropriate experiences. Two themes dominate participant responses within the category of personal decision making. First, a lack of situational awareness serves as a significant theme, as first responders may not be able to easily evaluate the entire situation based on either a lack of information or an abundance of information that cannot be quickly evaluated. Second, personnel are often overwhelmed by the scope and magnitude of the

event. These unique situations suggest the presence of unfamiliar or unexpected occurrences including odd requests. Pertinent responses are listed below:

Risk based analysis shows signs that are outside the norm.

Overwhelming amount of information being delivered in short time period.

Personnel are requesting many actions to occur and need additional resources.

Delays in decision making because of being overwhelmed with requests from subordinates, lack of accurate information, or rapidly evolving events.

Feeling a need to move more quickly with a sense of urgency. This can be a problem in my experience because I believe that slower more deliberate and well thought out steps are much more effective.

Odd requests.

Fully reactive and not ahead of current operations.

The sense that I don't have the complete picture of what is going on.

The inability to see the big picture at the start of the incident made decision making difficult. We needed additional command staff to feed information to the Incident Commander.

Persons with knowledge of the dangers of the situation were moving clear of the area.

4. Other Signals

Questions Eight and Nine allowed respondents to provide a list of signals that are not confined to the three categories listed above. Personal intuition was presented as an intangible signal that an event is becoming nonroutine. However, the capability, capacity and reaction of the command staff was the primary focus of the responses within this category. Reactions to these infrequent events include anxiety, stress, fatigue and the need to pause to collect

thoughts. This suggests that stress management and coping skills are critical success factors when facing the intensity of surge events. Illustrative responses are listed below:

Staff getting stressed, fatigued and taking actions beyond SOP's.

An anxiety level is evident in the voices on the radio communications.

Plans and resources are not effectively resolving the issue at hand.

Gut Feeling, uneasy about the situation, dry mouth.

Having to take a breath to collect my thoughts and become grounded.

Too many tasks, not enough personnel.

H. THE ABSENCE OF SIGNALS

1. Expected Signals That Were Not Present

Participants were asked to reflect on the situation envisioned in Question Nine and identify the absence of expected signals. Two participants skipped this question. Forty-six point four percent of respondents indicated that they had expected to see signals that were absent. Seven respondents provided clarifying responses. Four of these respondents identified that the lack of exterior signs of fire spread, including the smoke generation, was the expected signal most frequently absent as situations escalate. The three other responses described the absence of critical communications and lack of engagement of operational personnel. Examples of responses that indicated expected signals that did not appear include the following:

I expected someone else to communicate that conditions were becoming untenable, or that they needed more resources.
No exterior signs of fire or pressurized smoke.

In this incident there was an acid plume. One expects a plume to be a green cloud that is clearly defined and obvious. In this case,

the plume was large and dangerous but appeared to be normal steam, or a fog or cloud like mist. It almost looked like a normal situation.

2. Reaction to the Absence of Signals

Participants were asked to reflect on Question Ten and identify their reaction to the absence of expected signals. Seventeen respondents skipped this question, and thirteen respondents provided open-ended input and the themes as outlined in Table 8.

Table 8. Reaction to the Absence of Expected Signals

Reaction to the absence of expected signals	Frequency of response
Fell back to a safer strategy	3
Requested additional resources	3
Accepted recommendations of others (fire service personnel or outside experts)	2
Altered tactics	1
Created a staging area to control resources	1

Number of respondents = 13

Responses to this question included several actions designed to provide operational safety and prudent tactics. Responses focused on the need to regroup or reorganize to adapt to the demanding conditions presented by the incident. The development of a staging area provides the IC with both a central resource pool and the time to think about the best strategic options. Collaboration with other members and subject matter experts were presented as options relative to how to deal with the absence of expected signals. Examples of responses that indicated changes in strategic action include the following:

Created a staging location and instructed all units that any response will be deployed through the Staging Officer.

I accepted the recommendation of the Interior Operations Officer.

Operations ordered more ventilation which eventually revealed the fire.

The gas company representative was my subject matter expert. I felt quite uneasy to not take the steps that I wanted to take but I had to trust that his experience in this matter far exceeded any experience that I had.

I. DECISION-MAKING METHODOLOGY

1. Altered Decision making as Incidents Become Unpredictable

Participants were asked if they utilize different decision-making strategies as an incident becomes unfamiliar and unpredictable. One participant skipped this question. Seventy-two point four percent of respondents indicated that they do alter their decision-making strategies as incidents escalate. Those who responded cited eight different strategies that they would employ. These strategies are outlined from highest to lowest frequency of response. A breakdown of this analysis is detailed in Table 9:

Table 9. Changes in Decision-making Strategies

Altered Decision-making Strategies	Frequency of response
Collaboration – opinions and experts	6
Assign personnel to coordinate – additional command resources	4
Self preservation/defensive strategy	4
Seek assistance from those with experience	4
Bring in additional command resources – senior staff – mutual aid chiefs	3
Verify information from more than one source	3
Continually reevaluate the situation and potential courses of action	2
Maintain risk vs. gain strategic approach	1

Number of respondents = 29

Although the majority of Incident Commanders indicated that they would alter their decision-making methodology, 27.6 percent of respondents indicated that they would not alter their decision making. Affirmative responses indicated that they would pursue adaptive strategies and consider increasing collaborative efforts, and information verification. As events evolve, the lack of sufficient command staff is logistical problem, as it takes time to assemble appropriate personnel. Participants indicated that command resources would be increased, and the support of CFOs from mutual aid communities would be utilized as an adaptive tool.

Examples of responses include the following:

I try and seek out people that have a specialty in this area.

I would look to experts to assist me in making decisions.

Attempted to verify information from more than one source.

I look to other officers to assist in evaluating and interpreting the incident.

I use the help and support of mutual aid chiefs who have responded to the incident.

I call upon additional command resources for assistance and expand the number of personnel assigned to the command post.

Surge events are often high-stake situations where the lives of both civilians and first responders are at risk. Considering the strategic approach of measuring risk against gain, several responses projected a conservative approach in which resources would reformulate into a safer defensive position. Reflecting a change toward the theme of collaboration, several respondents indicated that they would add command staff and seek assistance from those with either expertise or experience.

Examples of responses include the following:

I changed from the tactical strategy of trying to suppress the fire to the strategic view of self-preservation (protecting my firefighters from danger).

If I believe the incident is not acting as I would predict, I step back , use a defensive strategy and reevaluate the situation.
My approach to decision making is much more conservative and a more thought out process.

I think that it is important to keep reassessing the situation.
Stepping back and getting additional input on what is going on.

I try to maintain a risk vs. gain approach based on the resources available.

J. CONCLUSION

Demonstrating a pattern of consistency, three of the top five themes presented through the analysis of Questions Eight and Nine are within the top five themes presented in the analysis of Questions Six and Seven. These three signals of chaos include; lack of progress in incident stabilization, overwhelmed, and insufficient resources. This level of consistency presents a compelling case for the importance of these signals. Two other themes noted in the analysis of all four questions included the presence of both multiple time sensitive decision points and the presence of unfamiliar or unexpected occurrences.

Four additional signals demonstrated a strong rate of response. Many respondents viewed the presence of a high level of situational awareness as a precursor to effective decision making. The lack of sufficient information during chaotic situations was routinely identified as a signal that emergency situations were exceeding the routine. This trend and the need for a continuous stream of reliable information was demonstrated across multiple questions. Surge events exceed normal operations and produce unfamiliar and unexpected occurrences. This lack of the familiar is often manifested by odd requests, a recognition of a lack of similar experience or by physical conditions on the incident scene. Another trend was the indication that surge events are marked by a strained

command structure as commanders face the need to rapidly address multiple decision points or manage operations at multiple locations.

The majority of respondents indicated that they would alter their decision-making methods when they observed the signals associated with the transition toward the nonroutine or chaotic. The primary adjustments were to increase the level of collaboration and add resources to the command structure in an effort to enhance the command and control of operations. As life safety is the primary concern of the American Fire Service, transition toward more conservative or defensive strategies that removed personnel from substation risk was common. Finally, respondents indicate the need to continually evaluate the situation and employ a strategy that balances risk and gain.

The identification of signals described above, or in some cases the absence of expected signals, are indicators that an incident is becoming emergent. Providing an inventory of these signals to ICs provides the fireground commander with a new resource that can enhance decision making by allowing the IC to anticipate incident transition. As the majority of respondents indicated that they would alter their decision making as an incident becomes unfamiliar and chaotic, the identification of signals that matter is critical to developing an anticipatory as opposed to a reactive response strategy. Gladwell states that the unconscious mind finds patterns in situations based on very narrow slices of experience.¹²² Through the identification of signals that matter, this thesis informs ICs with the thin slices of experience that can enhance decision making, as they face unfamiliar surge events.

¹²² Gladwell, *Blink*, 47.

THIS PAGE INTENTIONALLY LEFT BLANK

V. METHODS AND RESULTS—DELPHI ROUND TWO SURVEY

A. DEMOGRAPHICS AND SELECTION CRITERIA

The survey was sent to the same panel of 32 experts that agreed to participate in the Round One Delphi Survey. The respondents were once again polled using Survey Monkey, an online survey tool. On June 15, 2012, the link to the Second Round Survey was sent to participants who were asked to complete the survey within two weeks. The response rate was initially moderate; a reminder email was sent during the final week of the survey period. The survey was closed on June 29, 2012, two weeks after being distributed. Twenty of the thirty-two potential participants (63 percent) responded.

B. DELPHI SURVEY ROUND TWO: INSTRUMENTATION

Questions for Round Two of the Delphi survey were formulated based on the themes identified within the literature review as presented in Chapter II, and the results of the Round One Survey detailed in Chapter IV. The Round Two Survey Draft was pilot tested with several experienced CFOs from outside of the sample to clarify the intent and wording of the questions in the survey. The pilot process resulted in light editing of the questions in the survey. The second round questions were framed to rank the relative importance of signals identified in round one and identify concepts that would improve strategic decision making during the initial response to surge incidents.

The second round consisted of quantitative and qualitative questions that addressed two broad categories: (1) identification of strategic options to enhance decision making in surge events, and (2) identification of adaptive behaviors and creative ways in which improvisation will improve the effectiveness of response efforts. The survey was implemented using Survey Monkey, an online survey tool. The questions that were asked in Round Two can be found in Appendix C. One example of one rating and one open-ended question is contained in Table

10. The first two questions were administrative reiterating agreement to participate in the survey and asking for the entry of the participant's coded control number. .

Questions Three through Five were open-ended queries about the strategies the respondents use to compensate during the initial period of surge incident response. Question Six was a qualitative question that asked respondents to produce a narrative that identified strategies to filter the overwhelming amount of information that is frequently directed at the IC. The next two questions were quantitative questions that asked respondents to rate the relative importance of the eighteen signals that were identified in Round One and then choose their top five. The final two questions asked whether NIMS is an optimal response model, followed by a qualitative description of how NIMS could be enhanced. The results of Round Two are presented and discussed in Table 10.

Table 10. Delphi Survey Round Two Sample Questions

Quantitative and Qualitative Question Examples from the Round Two Survey	
Quantitative	<p>7. As a reminder during the first survey, you were asked to identify signals that an event is becoming unpredictable, unfamiliar or chaotic. Analysis of the responses to round one identified 18 themes by consolidating similar responses. As an example, responses including stress on the Incident Commander, anxiety, confusion, and dry mouth were consolidated into the theme of “overwhelmed.”</p> <p>The following listing summarizes the response from the group of participants and identifies 18 themes, which are listed from highest to lowest in terms of response frequency. Please rate each of the items below in terms of how important the signal would be to you in terms of indicating a situation is becoming unpredictable or chaotic. [Rating scale 1 = not important to 6 = extremely important]</p>
Qualitative	<p>9. Given the previously identified signals that a situation is becoming unpredictable, unfamiliar or chaotic, what decision aids would enable improved confidence and capabilities in responding to that situation? Decision aids can include tools for information gathering, situational analysis, decision-making processes, etc. You can draw on best practice experience or think about the time(s) you have said “if only we had...” it would have helped us.” These may be innovations that don’t yet exist.</p>

C. DELPHI SURVEY ROUND TWO: RESULTS

This section presents each question from Round Two and the results obtained. The Round Two Survey focused on the identification of strategies and behaviors that can enhance response efforts during the initial response to surge incidents. Qualitative responses were analyzed to identify themes and then all responses were categorized according to those themes.

D. STRATEGIES TO ENHANCE RESPONSE

1. Strategies to Get Ahead of the Event and Address a Lack of Resources

Questions Three and Five asked respondents to identify adaptive strategies used in the face of surge events. Based on the similarity of these two questions, the analysis of responses was consolidated. The two questions are listed below:

- 3. Surge events require more resources than are readily available. When encountering surge events such as a Mass Casualty Incident (MCI) what strategies do you employ to get ahead of the event?**
- 5. Often during chaotic events, the first few hours of response lack the required resource capability, how do you compensate?**

These questions sought to develop an inventory of strategies that respondents have utilized when faced with an emergent surge event. Participants were asked to identify strategies that have helped them address the lack of readily available resources and indicate how they get ahead of expanding surge events. One hundred percent of respondents answered both questions. . As the response data were analyzed, 14 themes emerged across responses for both Questions Three and Five. Themes were sorted by frequency with the most frequent response selected listed at the top of the table. Results are presented in Table 11:

Table 11. Strategic Options When Faced with Limited Resources

Strategies to Address Limited Resources Availability and Get Ahead of Surge Events	Frequency of response
Preplan, anticipation of probable events; activation of plans	12
Prioritize actions toward immediate needs (deployment of limited resources, focus on achievable goals)	12
Call for additional resources early (more than needed)	9
Expand ICS Structure, delegate responsibilities, empower personnel	7
Break the incident into manageable segments; adjust the length of operational periods	4
Construct options (multiple game plans)	3
Constantly seek updated situational awareness	3
Focus on macro view	3
Integration of external agencies—nontraditional es	2
Develop communications structure to match the incident	2
Relationship based response of local chief officers – informal support	1
Confer with Colleagues	1
Remain calm – influence on others	1
Time checks from dispatch center	1

Number of respondents = 20

The variety of responses provides an overview of how command officers pursue strategies to manage the challenges associated with unfamiliar and often chaotic incidents. Each of these concepts is a tool that can be employed to deal with the unique aspects of the mitigation of surge events. This inventory provides command officers with several strategies to consider as they confront asymmetric events. Analysis of both of these questions found three key themes, which include preplanning or anticipating probable events, prioritizing the deployment of limited resources and calling for assistance early.

Preplanning was identified as the primary factor to mitigate limited resource availability. Plans were viewed as providing a degree of guidance while the Incident Commander navigates the uncharted waters of a asymmetric response. Prioritizing resources and calling for assistance early in an event are common operating practices for the fire service, yet these concepts take on a higher level of importance as commanders are confronted with the intensity and magnitude of surge incidents. The three quotes below provide a variety of thoughts on this theme:

Preplanning for surge events allows you to access additional resources in a coordinated and organized manner – this allows you to focus on the situation at hand.

The key strategy is preplanning and having a plan in place for the event that occurs so infrequently. We often refer to it as the 3rd level of resources and having a plan in place and making sure that it is activated in a timely manner is critical to the eventual outcome of the incident.

Try to anticipate what types of events can create potential problem for your community. In our case we have in excess of 60 train crossings a day. Should a derailment occur, we have the potential to have several hundred casualties. It is paramount to know where available resources are and where they are coming from.

Prioritizing resources and calling for assistance early in an event are interrelated themes that are common operating practices for the fire service. These themes take a higher level of importance as commanders are confronted with the escalating resource needs of surge incidents. The three quotes below provide a variety of thoughts on these two themes:

As a fire officer you must prioritize the response and commit those resources and personnel to portions of the incident that have been identified as the highest need. This situation can be very frustrating and in many situations, you have to strategize based on your known asset availability

Request more resources than you think you will need. It's always easier to have the resources responding early than to not have enough and experience delays due to response times.

Front load resources for large/potentially complex events into the initial response. Call for additional resources at the first hint of the need for escalation based on the type of call, complexity of the incident, number of personnel needed to complete required tasks, duration of operational periods and the physical requirements of personnel. Be prudent but utilize the thought that it's better to be looking at them than waiting for them.

2. Regional Strategies to Complement the Initial Response

Participants were asked what regional strategies have been developed in their area to complement the initial response. One hundred percent of

respondents answered this question. The respondents cited nine different regional strategies that they would employ. These strategies are outlined from highest to lowest frequency of response. A breakdown of this analysis is detailed in Table 12.

Table 12. Regional Strategies to Improve Response

Regional Strategies to complement the initial response	Frequency of response
Regional / state mutual aid plans	22
Call for additional resources early	5
Relationship based response of local chief officers – informal support	5
Delegate responsibilities/ Assign ICS roles	3
County/area mutual aid center–Single point of contact	2
Integration of external agencies–nontraditional roles	2
Activate Incident Management Team (IMT)	1
Activate state rehab and command and communications resources	1
Scenario based training	1

Number of respondents = 20

The activation of regional and state level mutual aid plans was selected four times as often as any other theme. The extensive use of mutual aid represents the plan most often employed during times of crisis. Survey participants concurred that experience demonstrated that as surge events expanded, insufficient resources are often a central challenge and look to the presence of well thought out and updated mutual-aid plans to be the foundation of developing a sufficient response.

As incidents escalate, the IC is often overwhelmed with information and lacks the mental capacity and knowledge to organize a higher level of response that will produce resources from well beyond the commander's normal operating area. In these time-sensitive, high-consequence situations, commanders may not

have the ability to organize necessary resource requests. As an example, a recent response to a mill fire that occurred on July 27, 2012 in Charlton, Massachusetts required the response of more than 25 communities during the first operational period of this event. Considering the magnitude of this situation, the IC rapidly activated second and third tier response plans, which activated the response of this high concentration of resources. Activation of these second and third tier plans automated response of resources and provided an organized solution to the challenge of matching resource volume to the scope of the event. The two quotations below demonstrate the importance of these plans:

Regional strategies as far as resources have been worked into our response plan.

My metro region has a fantastic mutual aid and automatic aid response plan that is often utilized. A lot of planning has taken place to cover any event with manpower and equipment as quickly as possible with a single call for assistance.

Another theme of note is the relationship-based response of local CFOs. Respondents indicated that the response of CFOs from the local area often form the backbone of the first available level of support. The two quotations below indicate that in many jurisdictions this informal and often relationship-based response has become a normal operating expectation.

The automatic response of Chief Officers for command and control of resources from multiple jurisdictions, assistance with scene management, and safety are critical.

Mutual aid relationships include the response of Chief Officers to assist with incident management functions.

E. INFORMATION MANAGEMENT

1. Strategies to Avoid Becoming Overwhelmed by Incident Related Information

Participants were asked to reflect on how they manage the overwhelming level of information that is often directed at the IC during the response to significant events. One hundred percent of respondents answered this question.

The respondents cited eleven different strategies that they would employ. These strategies are outlined from highest to lowest frequency of response. A breakdown of this analysis is detailed in Table 13:

Table 13. Strategies to Manage and Filter Information Flow

Strategies to manage and filter information flow	Frequency of response
Expand ICS Structure, delegate responsibilities, empower personnel	9
Utilize an aide, liaison, scribe, communications specialist	8
Write down plans, checklists	5
Break incident into manageable segments	3
Relationship based response of local chief officers–informal support	3
Security, isolation of command post	1
Conduct regular internal briefing session	1
Ensure competence of key personnel	1
Radio communications discipline	1
Confirm credibility of information	1
Assign public information officer–conduct press briefings away from the command post	1

Number of respondents = 20

The previous survey round identified that the IC can often be overloaded by incident related information. Although some of this information is valuable, much of the information directed toward the IC is irrelevant or unverified. Three primary strategies emerged to sort, filter and manage information during emergency operations emerged. These themes include expanding the ICS structure, utilizing and aide or liaison, and documentation through job aids. The four quotes provide a variety of thoughts on the central theme of expanding the ICS Structure:

If you utilize an expanding system that builds out positions within the ICS system and have competent people filling those key positions, you will give yourself the greatest opportunity of success.

Build out the ICS structure to delegate different areas of responsibility to others.

Having an Operations Officer directly at the heart of the situation is critical. In addition, calling in additional resources sooner than later allows for more positions within the ICS sphere to be filled thus reducing the information overload and allowing the IC to establish a tactical plan.

I try to expand the incident command structure to the level necessary to maintain a span of control of five. This is sometimes very difficult during the initial phase of an incident. Having close working relationships with area chiefs allows for a more rapid expansion of the command structure.

The utilization of a liaison or aide presented as a very popular strategy. Assigning a second person to work with the Incident Commander reflects principles that are automated in other incident management structures. As an example, the German IMS system automates the response of a three-person incident management support team to both routine and nonroutine incidents. The presence of an aide or liaison serves as a safety net that extends the capability of the IC. The two quotations listed below demonstrate the value of this concept:

I am fortunate to have an aide; his help in the command post is immeasurable and provides a synergistic relationship. Although he is not a command officer, our open lines of communication allow him to be a second set of eyes and ears in the CP. He shadows my tactical worksheet as a safety net that enables us to track (and not lose) all resources. Additionally, he monitors and operates other radio channels so that I can focus on the tactical channel assigned to the incident. I don't have to move my attention from the scene to communications to provide update or call for assistance.

I assign a liaison to assist me with the filtering of information and keep the face-to-face contact to a minimum while I am developing a strategy..

F. RANKING THE IMPORTANCE OF SIGNALS INDICATING AN EMERGENT EVENT

Questions Seven and Eight asked respondents to reflect on the 18 themes that an emergency is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic. One respondent skipped both questions. The two questions are listed below:

- 7. As a reminder, during the first survey you were asked to identify signals that an event is becoming unpredictable, unfamiliar or chaotic. Analysis of the responses to round one identified 18 themes by consolidating similar responses. As an example, responses including stress on the Incident Commander, anxiety, confusion, and dry mouth were consolidated into the theme of overwhelmed.**

The following listing summarizes the response from the group of participants and identifies 18 themes, which are listed from highest to lowest in terms of response frequency. Please rate each of the items below in terms of how important the signal would be to you in terms of indicating a situation is becoming unpredictable or chaotic. [Rating scale 1 = not important to 6 = extremely important]

- 8. From the list above, please utilize your experience to pick the five signals that you feel are most important.**

Question Seven asked participants rate the relative importance of each signal on a six-point Likert Scale that used responses ranging from not important (1) to extremely important (6). Question Eight asked respondents to select the top five signals that they felt were the most important. The themes developed during the analysis of Round One were utilized as a basis for these two questions.

Analysis of these data resulted in the formation of two tables. The first table ranks the 18 signals using the mean score as basis for evaluation. Based on an evaluation of the data, the top nine signals were considered to be very important, while the bottom nine signals were identified by the respondents as somewhat important since all but one are greater than three and one half

(midpoint of the scale). As all of the top five signals identified by Question Eight are found within the group of very important signals, a high level of consistency is noted between the two questions. None of the 18 themes listed were considered to be unimportant. Data presented has been sorted to show the most frequent themes at the top of each table. A breakdown of this analysis is detailed Table 14.

Table 14. Importance of Signs of Incident Transformation

Signs of Incident Transformation	Mean Score
Safety compromise (loss of accountability, mayday, victim/firefighter injury)	5.7
Lack of progress (situation escalates, unable to complete assignments)	5.4
Strained command structure (lack of structure, unable to manage roles)	5.2
Communications strain/breakdown (interoperability, radio system overload)	5.2
Lack of sufficient information (situational analysis)	5.1
High risk decisions (risk based analysis)	5.0
Insufficient resources (loss of span of control)	4.8
Lack of teamwork (freelancing)	4.8
Overwhelmed (anxiety or confusion)	4.8
Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, reporting volume not matching)	4.6
Managed by the incident (reactive nature emerges)	4.5
Command inundated with information (external concerns, requests for information)	4.4
Multiple decision points/priorities (multiple operational sites/incidents)	4.4
Loss of responder composure (paralysis, frustration, errors)	4.3
Complex operations/structure (need to collaborate)	4.2
Need to redeploy resources (defensive posture)	3.9
Sense of urgency (intuition, voice modulation)	3.8
Time expectations exceeded	3.4

Number of Respondents = 19

The compromise of safe operations has been a theme that has reverberated through both survey rounds. This indicates the importance of safety as a foundation that facilitates forward progress in the mitigation of emergency incidents. Strained command structure, communication compromise, and the lack of situation awareness have all been a reoccurring focus of respondents.

Question Eight asked respondents to rank the five most important signals of incident transformation. The theme of safety compromise was selected as the top signal with the concurrence of nine respondents. (47.4 percent). A wide distribution of responses was noted in the remaining four prioritized rankings, indicating a wide variety of opinion relative to the importance of these signals. Each of the 18 signals was selected by at least one respondent as being among the top five signals. Analysis of this data indicates a concurrence that the top nine signals identified in Table 14 have a high level of importance. A breakdown of this analysis is detailed Table 15:

Table 15. Ranking the Top Five Signals of Incident Transformation

Ranking the Top Five Signals	Ranking	Percentage score
Safety compromise (loss of accountability, mayday, victim/firefighter injury)	1	47.4% (9)
Lack of sufficient information (situational analysis)	2	21.1% (4)
Strained command structure (lack of structure, unable to manage roles)	3	21.1% (4)
Lack of progress (situation escalates, unable to complete assignments)	4	15.8% (3)
Insufficient resources (loss of span of control)	5	15.8% (3)

Number of respondents = 19

The consistency presented between the responses to these separate questions indicates there is a high degree of concurrence relative to the top signals that commanders should consider as they face surge events. This question further defines the inventory of signals created by the Delphi panel in Round One.

G. DECISION AIDS

1. Decision Aid and Tool to Build Confidence and Capacity

Table 16. Somewhat Important Themes Identifying Signs of Incident Transformation

Decision Aids to Increase Confidence and Capability	Frequency of response
Video based aerial reconnaissance (drone, helicopter)	4
Sensor based computerized accountability	4
Automatic Incident Management Team (IMT) response	4
Training programs and exercises	3
Video conferencing capability with experienced personnel or subject matter experts	2
Sensor based interior monitoring of temperature, thermal imagery	2
Computerized checklists and preplan data	2
Internet access on the incident scene	1
Relationship based response of local chief officers – informal support	1

Number of respondents = 19

Participants were asked to identify decision aids and tools that would improve the IC's confidence and expand response capabilities. Nineteen (95 percent) percent of survey participants answered the question. One respondent skipped this question. The respondents cited nine different concepts that they would employ. Sixty-six percent of the response involves the expanded use of technology, while the other 34 percent focus on organizational policy, training and relationship based support. These ideas are outlined from highest to lowest frequency of response. A breakdown of this analysis is detailed in Table 16.

Responses to this question demonstrate that ICs seek to enhance the level of information they can access. Specifically the use of aerial reconnaissance offers a macro perspective of evolving conditions that is often elusive on the incident scene. Using sensors embedded with crews operating in remote areas provides a micro perspective of the conditions and serves as a mechanism to evaluate conditions in an area of operation and a means to enhance the safety of operating personnel. The third notable theme refers to the expansion of the ICS system and automated response of resources, such as the

response of area CFOs. A variety of quotes that demonstrate the need for increased reliable incident based information is contained below:

Resources such as aerial recon can be extremely effective. The Tampa Florida Police Department puts a helicopter in the air that streams live video and provides other information based resources to the IC on any second alarm or greater fire.

Increased and more accurate information from within and around the incident. Better audio, video or data relative to the incident can help an experienced command staff to make informed decisions.

I personally respond best to visual cues, so it is important for me to have visual inputs when making decisions.

We need to have better real time incident mapping to give the IC a virtual birds eye view on a large screen such as the window panels displays that are in some hotel lobbies.

H. INCIDENT MANAGEMENT SYSTEM EVALUATION

1. NIMS as an Optimal Model

Participants were asked to indicate if NIMS is an optimal model for making decisions during unpredictable and unfamiliar events. Nineteen (95 percent) survey participants answered the question. One respondent skipped this question. Fifty-seven point nine percent of respondents indicated that NIMS was the optimal incident management system model, while 42.1 percent indicated that it was not the optimal model. Respondents were afforded the opportunity to comment on the reasons behind their respective answer. All nineteen respondents (100 percent) provided a narrative to substantiate their response. Analysis of the response to the qualitative portion of this question focused on the identification of common themes. These themes are outlined from highest to lowest frequency of response in Table 17–18:

Table 17. Comments that NIMS is the Optimal IMS Model

Comments that NIMS is the Optimal IMS Model	Frequency of Response
Standard tool—proper framework	4
Scalable and provides structure	3
Helps break incident into manageable segments	1
Ensures both control and information flow	1
Other systems are not more effective	1

Table 18. Comments that NIMS is Not the Optimal IMS Model

Comments that NIMS is not the Optimal IMS Model	Frequency of Response
Not a flexible system	3
Use instinct in unfamiliar situations	2
Not applicable in smaller communities	2
Not optimal in rapidly expanding incidents	1
Things need to be tweaked for each department/situation	1

Number of respondents = 19

Responses indicate that there is wide disagreement relative to NIMS being the optimal model for and IMS System. The following include a variety of comments that illustrate both sides of this debate:

2. Responses Supporting NIMS ICS as the Optimal Model

NIMS ICS gives us a proper framework to handle all situations big and small.

If properly expanded NIMS ICS should be able to support any event.

The use of ICS at every event is important. The use of this system at larger and unpredictable events is needed in order to have proper control and a good flow of information.

NIMS addresses key factors of organizational and human limitations. Other models may be imaginative, but are not likely to be truly more effective.

3. Responses Suggesting That NIMS ICS is not the Optimal Model

NIMS is a great foundational guide but I don't think it can be used in some situations that become too big too quickly.

While I do believe in NIMS as a model, and would have answered that it was the optimal framework, I chose that NIMS was not the optimal model because I feel we are often expected to blindly follow the system without regard to the individual circumstances.

I think NIMS is a fantastic resource when you have the staff necessary to implement the system.

In smaller communities, it may not be possible for resources to assemble quick enough for command to establish an appropriate structure to mitigate the chaotic situation.

4. Improvisation to Adapt NIMS

Participants were asked to identify strategies that they have utilized to make ICS more effective, as they have faced the challenges of responding to surge incidents. Nineteen (95 percent) of the survey participants answered the question. One respondent skipped this question. Fifty-two percent of the respondents indicated that they have improvised or adapted ICS to be more effective and 47.4 percent indicated that they have not altered the structure of ICS. In addition to answering the quantitative question, seven respondents provided a narrative detailing how they have improvised NIMS. A table was constructed to capture pertinent themes that substantiate their respective open-ended responses. The respondents cited three different concepts that they have utilized to adapt ICS. These themes are outlined from highest to lowest frequency of response in Table 19.

Table 19. Observations Improvising and Adapting ICS

Strategies to improvise and adapt NIMS	Frequency of response
Assign personnel to multiple command roles	4
Deferred assuming command as the first unit arrives	2
Setup nontraditional groups (natural resources, environmental)	1

Number of respondents = 7

Two significant concepts for altering NIMS were presented by the seven survey respondents that provided a narrative relative to how they have altered NIMS. First, consistent with the themes of both insufficient resources and an initial lack of command staff, assigning personnel to multiple roles was the most popular adaptive strategy. Second, deferring the assumption of command was also presented as a tactical option when a lack of resources exist on the incident scene. Typically, command is assumed upon the arrival of the first emergency response unit. The concept of deferring the assumption of command means that first arriving responders would concentrate on incident control tactics. Command would be formally assumed at a later time concurrent with the arrival of secondary responding units. Although this concept is contrary to the principles of NIMS that emphasis the value of initiating strategic actions as soon as personnel arrive on the incident scene, this strategy was consistent with an adaptive measure to overcome the initial lack of resources that threads through much of this thesis. Two quotations below indicate the strategy to assign personnel to multiple command roles or positions during the initial phase of surge events.

I have had people assume multiple command roles when there should have been one person assigned to each role.

A MCI may require a Medical Officer and an Operations Officer

I. CONCLUSION

Building on the foundation of knowledge accumulated in Round One, several consistent themes are beginning to emerge. The goal of Round Two was

to validate and prioritize the results from Round One pertaining to the rating of signals that indicate an incident is becoming emergent and to develop useful information pertaining to both the coordination of response and information management strategies. A high level of agreement was demonstrated as the 18 themes identified in Round One were classified by respondent's opinion of importance in one question and then ranked to identify the top five themes. This classification can serve to inform Incident Commanders and provide perspective on the importance of these signals. The top five signals identified by the Delphi panel are listed below:

- Safety compromise (loss of accountability, mayday, victim/firefighter injury)
- Lack of sufficient information (situational analysis)
- Strained command structure (lack of structure, unable to manage roles)
- Lack of progress (situation escalates, unable to complete assignments)
- Insufficient resources (loss of span of control)

Permeating the entire survey round, responses emerged suggesting that the mitigation and coordination demands of surge incidents often exceed the initial command and control capacity of the responders. Several responses note that resources beyond those thought to be needed should be immediately requested in an effort to match resources to the scope of the event. During the initial operational period, ICs often lack a sufficient number of qualified personnel to fill command roles and expand the ICS system. The most common solution to this shortfall is the informal and often relationship-based response of CFOs from the immediate area. Although the use of more formalized resources was also discussed, this informal, networked response offers the most rapid infusion of expertise that can form a cohesive command team.

Resource acquisition during surge incidents is often accomplished through preplanning for a specific event or through more generalized response plans that are designed for a wide variety of surge incidents. Several respondents

commented on the need to utilize second (regional) and third (state) tier mutual aid plans as a prerequisite to success. These plans provide a level of organization that would not be possible for an IC to develop in the heat of battle.

This chapter provides the IC with a series of ideas that can enhance the ability to cope with surge events. Respondents provided and ranked a variety of strategic ideas that have produced successful results as experienced ICs have faced the demands of surge events. Although some of these concepts are familiar to the majority of respondents, a number of these coping strategies, such as the idea to assign a communications specialist known as Communications Leader (COML), were not well known. The importance of this chapter is that it provides a toolbox of strategic options. This thesis has provided the opportunity for 32 experienced fire officers to build consensus and share new ideas, best practices, and innovations. Hintze claims that the concept of experts and novices identifies the need for mentoring as a tool that can help the novice build proficiency.¹²³ Although many blogs and Internet resources exist, the American Fire Service lacks an effective way to routinely share the experience of others. Addressing this need could extend the value of this thesis.

The results accrued through the analysis of Round Two were utilized to inform Round Three Questions. Round Three Questions focus on the identification of concepts that contribute to value and/or the effectiveness of operations, determining the frequency that various command strategies are utilized, and gauging the receptivity to implementation of IMS components from other models. This progressive approach to the development of this research process will identify the most promising strategic options based on the emerging consensus of the Delphi panel.

¹²³ Hintze, *First Responder Problem Solving*, 89.

VI. METHODS AND RESULTS—DELPHI ROUND THREE SURVEY

A. DEMOGRAPHICS AND SELECTION CRITERIA

The survey was sent to the same panel of 32 experts that agreed to participate in the Round One Delphi Survey. The respondents were once again polled using Survey Monkey, an online survey tool. On July 28, 2012, the link to the Third Round Survey was sent to participants who were asked to complete the survey within two weeks. The response rate was initially moderate, a reminder email was sent during the final week of the survey period. The survey was closed on August 5, 2012, two weeks after being distributed. Twenty-one of the thirty-two potential participants (66 percent) responded.

B. DELPHI SURVEY ROUND THREE: INSTRUMENTATION

During this research project, questions for Round Three of the Delphi survey were formulated based on the themes identified within the literature review as presented in Chapter II, and the results of the previous two survey rounds detailed within Chapters IV and V. As the survey was drafted, it was piloted tested with several experienced Chief Fire Officers from outside of the sample to clarify the intent and wording of the questions in the survey. The pilot process resulted in light editing of the questions in the survey.

The third round consisted of quantitative and qualitative questions that addressed the three broad categories: (1) Concepts that contribute to value and/or the effectiveness of operations, (2) Frequency that identified command methods and strategies utilized, (3) Receptivity to implementation of IMS components from other models.

The questions asked in Round Three can be found in Appendix C. One example of one rating and one open-ended question are contained in Table 18. The first two questions were administrative. The remainder of the survey consisted of three quantitative and five qualitative questions.

Question Three was an open-ended query on ideas to make mutual-aid more effective. Questions Four and Six were quantitative questions that asked participants to rate the frequency of use of 18 methodologies to assist in the management of surge events identified in Round Two respondents were also asked to indicate the likelihood of future adoption, if they had never used these methods previously. Question Five was an open ended query that asked participants to identify how the response of additional CFOs from the area could be strengthened. Question Six was an open-ended query that asked respondents to identify methods to filter the overwhelming amount of information that is often directed at the IC. Question Seven was a quantitative question that asked participants to classify the priority for investment in the development of decision aids identified in Round Two. Question Eight was an open-ended query that asked participants to provide other ideas relative to the development of decision aids that are useful during the response to surge events. Chapter III provides a compares NIMS to the German IMS system known as DV 100. This comparative analysis identified several differences in these two IMS systems that informed the development of Question Nine. This quantitative question queried respondents about their willingness to adopt methodologies identified through the review of the German IMS (DV 100). The final question was an open-ended query that asked respondents to provide any creative or innovative ideas that would enhance the ability to cope with unfamiliar incidents.

Table 20. Delphi Survey Round Three Sample Questions

Quantitative and Qualitative Question Examples from the Round Three Survey	
Quantitative	<p>9. During the second round Delphi survey, approximately 45 percent of respondents indicated that the National Incident Management System (NIMS) is not an optimal model for making decisions during unpredictable and unfamiliar events. A review of the German Regulation DV 100 (the German equivalent to NIMS) identified several potential concepts. Would you support modifying NIMS with these practices?</p> <p><i>Ten practices were listed in this question and respondents were asked indicate if they would support modifying NIMS with these practices by answering yes or no.</i></p>
Qualitative	<p>5. Other than the use of mutual aid plans, the second round Delphi survey suggested that one of the next most important capabilities is the informal response of area Chief Officers. The following quotes are taken from round two survey responses.</p> <p>“The automatic response of area Chief Officers provide assistance with scene management, safety, and the control of resources from multiple jurisdictions.”</p> <p>“Mutual aid relationships include the response of Chief Officers to assist with incident management functions. This can be informal, with chiefs responding with their companies as part of the mutual aid response.”</p> <p>How could the value of the informal response of area Chief Officers detailed above be strengthened?</p>

Following the principles of the Delphi method, the results were analyzed, coded and mapped. The results of Round Three are presented and discussed below.

C. DELPHI SURVEY ROUND THREE: RESULTS

This section presents each question from Round Three, and the results obtained. The Round Three Survey was focused on four broad categories: (1) identifying the frequency of use of incident command strategies identified in the previous two survey rounds, (2) Determining the priority for funding of concepts that would enhance decision making and (3) considering the potential of adoption of IMS principles from other models and (4) developing an inventory of other creative and innovative ideas to enhance decision making and cope with unfamiliar situations. Qualitative responses were analyzed to identify themes and then all responses were categorized according to those themes.

D. EFFECTIVENESS OF MUTUAL AID

1. Improving the Second and Third Tier of Mutual Aid Response

Participants were asked to reflect on what could make the existing second (regional) and third (state) tier mutual aid plans more effective. One hundred percent of respondents answered this question. The narrative responses were analyzed and eleven themes emerged. These ideas are outlined from highest to lowest frequency of response. A breakdown of this analysis is detailed in Table 21:

Table 21. Ideas to Improve Second and Third Tier Mutual Aid Response

Ideas to Improve the Effectiveness of Second and Third Tier Mutual Aid Response	Frequency of Response
Increase training opportunities	10
Increase the number of simulations conducted	9
Build awareness of mutual aid plans	4
Review and update mutual aid plans	3
Provide interagency training opportunities	3

Ideas to Improve the Effectiveness of Second and Third Tier Mutual Aid Responses	Frequency of Response
Automate response	2
Preplan communications	2
Develop a enhanced regional focus	2
Eliminate competing plans	1
Provide statewide situation and resource status reporting	1
Develop a resource inventory system	1

Number of respondents = 21

Respondents indicated broad agreement pertaining to the use of and need for second and third tier mutual aid plans. A number of comments indicated concern over the infrequent use of these plans and the lack of training and updates. To improve the effectiveness of these plans, respondents indicated there should be more training and exercises, marketing efforts to build awareness and increase use, and periodic review and update of these plans. Two quotations illustrating the need for training and exercises are listed below:

I find that these plans, while great on paper, are not utilized often and therefore we are not afforded the opportunity to find the flaws. We need to either train in the use of the plans more often or ease the rules associated with the third tier of mutual aid.

One of the major problems with the infrequency of the major event is that we do not practice very often for them.

Four respondents indicated there was a need to build awareness of the plans within a broader fire service audience. One narrative mentioned that there should be a more intensive effort to create buy-in through a more participative development process. Another indicated that awareness of the operational aspects of the second and third tier response plans need to extend beyond the rank of CFO. The two quotes listed below focus on this the need for expanding awareness:

Effectiveness of mutual aid plans is defined by awareness of the plan and familiarity with the plan.

There needs to be training at the community level about the resources that are available and the way the system works.

E. COMMAND STRATEGIES

1. Frequency of Use and Potential Adoption of Strategies Utilized During Routine Command Operations

Respondents were asked to indicate the frequency they use various strategies that were identified by concepts within the literature review and information provided through the first two Delphi survey rounds to enhance command capacity. If respondents selected they never use the specific strategic option listed, they were asked if they would consider future adoption of this concept. One hundred percent of respondents answered this question. The column shaded in grey captures the percent of respondents that indicated they had never utilized the strategy listed, but they would consider adoption of this idea in the future. A breakdown of this analysis is detailed in Table 22:

Table 22. Frequency of Use and the Potential of Adoption of Strategies to Enhance Command Capacity during Routine Command Operations

	Never	Seldom	Sometimes	At all Significant incidents	Would Consider Adoption in the Future
Assign a Liaison Officer	19%	33%	19%	29%	19%
Assign a Safety Officer		5%	9%	86%	5%
Develop a Unified Command Structure		5%	38%	57%	
Utilize Command Staff or Additional Chief Officers from the Local Area	5%		30%	65%	5%
Appoint a Deputy Incident Commander	33%	33%	9%	19%	24%
Appoint a Deputy Operations Officer	33%	19%	24%	19%	29%
Assign personnel to the Logistics Section	16%	26%	26%	32%	16%
Assign personnel to	28%	24%	24%	24%	14%

the Planning section					
Assign personnel to the Finance Section	38%	29%	19%	14%	14%
Request more resources than the initial assessment indicates		29%	42%	29%	
Break the incident into manageable segments	5%	5%	38%	52%	5%
Constantly seek updated situational awareness		5%	9%	86%	
Confer with experienced colleagues that are not on the incident scene	19%	24%	38%	19%	14%
Construct options (multiple game plans)	5%	29%	47%	19%	
Integrate nongovernmental personnel (e.g., local experts, private sector resources)	5%	45%	30%	20%	
Adjust the length of operational periods	14%	33%	39%	14%	5%
Automate notification of elapsed time through your dispatch center	29%	19%	14%	38%	24%

Number of respondents = 21

It is interesting to note that all 17 ideas enjoy a wide range of use. Concepts that were the most frequently utilized include the following:

- Assignment of a Safety Officer;
- Constantly seeking updated situational awareness;
- Utilizing command staff or additional CFOs from the local area;
- Development of a unified command structure;
- Break the incident into manageable pieces.

Respondents that answered “never” were asked if they would consider adoption in the aftermath of this survey process. Ideas that respondents indicated they would most frequently consider for future adoption include the following:

- Assignment of a Deputy Operations Officer;
- Assigning a Deputy Incident Commander;
- Automation of elapsed time notification;
- Assignment of a Liaison Officer.

Many of the respondents indicated that they would consider adopting one or more of these concepts. Providing commanders with new concepts and ideas is one of the main goals of this thesis.

2. Strengthening the Value of Informal Response

Responses during the first two rounds of the Delphi survey process indicated that the informal response of local chief officers was a valuable tool in managing surge incidents. Participants were asked to reflect on how the value of the informal response of area chief officers could be strengthened. One hundred percent of respondents answered this question. The responses were analyzed and eleven themes were identified. These ideas are outlined from highest to lowest frequency of responses in Table 23:

Table 23. Ideas to Enhance the Value of the Informal Response of CFOs

Ideas to Enhance the Value of Informal CFO Response	Frequency of response
Formalize response plan	8
Provide regional planning and training	7
Automate response	5
Require participants to opt in	2
Provide role specific training	2
Provide access to experts	2
Create a field operations guide (FOG)	2
Expand personal relationship	1
Identify roles and expectations	1
More experience to build skill	1
Create written backup documentation	1

Number of respondents = 21

Based on the responses to the previous questions, obtaining informal support from local CFOs is a strategy employed by the vast majority of participants. Consistent with previous questions, the need to formalize this support mechanism through regional planning, and an expanded scope of training remains an open opportunity. This informal support methodology is typically developed through personal relationships and networking. The highest response indicated that support network generated by the response of local CFOs should be both formalized and automated. The following three quotations relate to the need to formalize incident support response:

Formalize plans and activations, create position specific personnel with alternate team members to provide consistent response.

Move to a more structured IMT approach.

Make this a formal specific level of response that has multiple layers to fill command roles with experienced personnel.

Another theme is the need to automate the activation of the system and response of Chief Officers within the immediate area. Although automation is linked to formalization, it involves separate actions, these distinct comments were captured within several narratives.

To strengthen their response it needs to be added to running cards that would automatically activate response.

Command staff should be considered as part of the complement of additional resources that are added to a response.

3. Frequency of Use and Potential Adoption of Command Methodologies During the Response to Surge Events

Respondents were asked to indicate the frequency they use various command methodologies during the response to surge events. These methodologies were identified by concepts within the literature review and information provided through the first two Delphi survey rounds. If respondents selected they never use the specific strategic option listed, they were asked if they would consider future adoption of this concept. The column shaded in grey captures the percent of respondents that indicated they had never utilized the strategy listed, but they would consider adoption of this idea in the future. One hundred percent of respondents answered this question. A breakdown of this analysis is detailed in Table 24.

Table 24. Identification Frequency of Use and the Potential of Adoption Command Methodologies during the Response to Surge Events

	Never	Seldom	Sometimes	At all Significant incidents	Would Consider Adoption in the Future
Expand ICS structure, delegate responsibilities, empower personnel		10%	10%	80%	
Utilize an aide	5%	14%	38%	43%	
Assign a liaison		44%	25%	31%	
Assign a scribe	10%	38%	28%	24%	10%
Assign a communications specialist (COMM L)	24%	33%	14%	29%	5%
Write down plans, complete checklists	5%	24%	33%	38%	5%
Break the incident into manageable segments		14%	43%	43%	
Encourage the relationship based response of local chief officers – informal support	10%	10%	33%	47%	5%
Implement security at the command post	43%	14%	24%	14%	33%

	Never	Seldom	Sometimes	At all Significant incidents	Would Consider Adoption in the Future
Move the command post away from the incident scene	10%	29%	43%	14%	5%
Conduct regular internal briefing sessions		14%	43%	43%	
Limit radio traffic to critical communications	10%	24%	33%	33%	5%
Verify the credibility of information	10%	14%	38%	38%	10%
Assign a Public Information officer (PIO)		14%	43%	43%	
Conduct press briefings away from the command post	10%	10%	37%	43%	5%

Number of respondents = 21

It is interesting to note that all 15 concepts presented enjoy a wide range of use. Ideas that respondents indicated they would most frequently consider for future adoption include the following:

- Expand ICS structure, delegate responsibilities,
- Encourage the relationship-based response of local chief officers – informal support
- Conduct press briefings away from the command post

- Conduct regular internal briefing sessions

Respondents that answered never were asked if they would consider adoption in the aftermath of this survey process. Many of the respondents indicated they would consider adopting one or more of these concepts. Ideas that respondents indicated they would most frequently consider for future adoption include the following:

- Implement security at the command post
- Assign a scribe
- Verify the credibility of information

F. CONCEPTS TO ENHANCE DECISION MAKING

1. Ranking the Priority of Investment in Decision Aids

Responses during Round Two of the Delphi survey process identified several ideas for the development of decision aids that would assist commanders with decision making. Participants were asked to rank the priority of investment in the eight concepts listed in the three tables below. One hundred percent of respondents answered this question. These ideas were outlined from highest to lowest based on frequency. A breakdown of this analysis is detailed in Tables 25–27:

Table 25. Top Priority Investments

Top Priority Items	Average rating	Percentage and number of responses indicating this investment was a top priority
1. Training programs and exercises	2.7	76% (16)
2. Automatic Incident Management Team (IMT) response	2.6	62% (13)
3. Computerized check lists and preplan data	2.5	62% (13)
4. Enhanced accountability systems that indicate personnel position and elevation using sensors	2.5	65.% (13)

Table 26. Medium Priority Investments

Medium Priority Items	Average rating	Percentage and number of responses indicating this investment was a medium priority
1. Internet access on the incident scene	2.2	50% (10)
2. Sensor based interior monitoring of temperature and thermal imagery	2.0	55% (11)

Table 27. Low Priority Investments

Low Priority Items	Average rating	Percentage and number of responses indicating this investment was a low priority
1. Video conferencing capability with experienced personnel or subject matter experts	1.7	45% (9)
2. Video based aerial reconnaissance	1.4	70% (14)

Number of respondents = 21

The information in the tables is further distilled to provide an overall view of this quantitative rating process. This information is detailed in Figure 7:

Round two generated many good ideas on decision aides and I would like your feedback on some of these concepts. If you were recommending investment in each of these decision aids listed below, what priority would you give each of the eight concepts listed below? Please select no more than three items for each category.

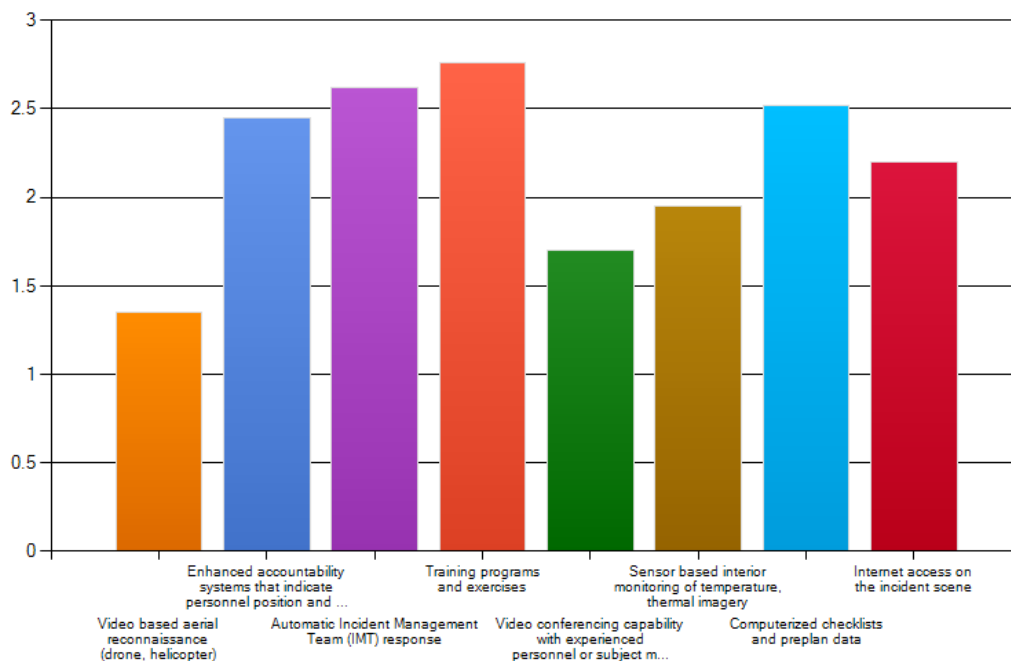


Figure 7. Decision Aid Investment Rating Chart (Produced by the author based on Round Three responses)

The second round of the Delphi process asked participants to identify potential decision aids that would enhance decision making. In Round Three, this list was then imported into a rating scale in which respondents had to choose the investment priority. A comparison between this question and the Round Two question on the identification of decision aids found a disparity in that items shifted dramatically when the focus of the question shifted from value associated with the concept to investment priority. As an example, video based aerial reconnaissance was viewed as the most valuable decision aid to inform situational awareness. However, this became a low priority when the question was reframed to consider investment. Some of this change in response might be associated with the fact that development of unfamiliar technologies could be perceived as cost prohibitive. As a second example, development of training programs and exercises was a mid-level priority in terms of value in Round Two, yet when the framework of investment was imposed, training and exercises became the top investment priority. Some of this change might be associated with respondent familiarity with training and exercise programs, as well as the benefit of being able to easily identify the actual cost of this methodology.

2. Ideas on Decision Aids

Although the Round Two survey asked respondents to identify decision aids, this segment of the Round Three survey provided an additional opportunity to further expand responses at the close of this survey process. Nine (43 percent) participants answered this question and twelve (57 percent) skipped this question. Four themes were identified that focused on different ideas that have the potential to strengthen response efforts. These ideas are outlined from highest to lowest frequency of response. A breakdown of this analysis is detailed in Table 28.

Table 28. Ideas for Decision Aids

Ideas for Decision Aids	Frequency of response
Development of field operations guides (FOG) and backup documentation	4
Access to experts	2
Increased tabletop exercises	2
Increased networking opportunities	1

Number of respondents = 9

Although the need for training and exercises remains a constant theme, the development of a quick reference document that summarizes operational policies was the most frequent response. This type of document is known as a Field Operations Guide (FOG). Several comments noted the propensity for technology to fail when it is needed most and the development of a FOG was viewed as instructive backup in the event of technological failure. Another theme is the respondent's desire to involve experts in the decision-making process. This represents an open and inclusive attitude to incorporate nontraditional personnel into the command team. Three pertinent comments associated with these two themes are listed below:

Pocket guides are also helpful. During a prolonged incident you don't need to worry about running out of battery power on a handheld device if you have the information in a printed pocket guide as a backup!

There is a concern for high tech not working because of infrequent use.

Access to experts. If I am dealing with a flood situation, I want to speak with a dam engineer.

G. COMPARATIVE ANALYSIS: GERMAN VERSES U.S. IMS

1. Potential Adoption of German IMS Principles

During the development of this thesis, a comparative analysis was done comparing NIMS and the German IMS system known as DV 100. This analysis

is further presented within Chapter III. The comparative findings informed the development of this area of research. Based on this analysis, several aspects of DV 100 were evaluated on the potential for these concepts to be imported into NIMS. Ten ideas, which are discussed in Chapter III, were presented for participants to indicate if they would support modifying NIMS with the concepts listed in Table 29. One hundred percent of respondents answered this question. These ideas are outlined from highest to lowest frequency of affirmative response. Analysis of these data indicates that the vast majority of respondents are open to considering ideas that may improve the effectiveness and efficiency of NIMS. A breakdown of this analysis is detailed in Table 29.

Table 29. Adoption of Comparative Concepts

Would you Support Modifying NIMS with German Concepts	Yes	No
Development of situational analysis teams (dedicated personnel that focus on gathering and verifying information for the Incident Commander)	100%	
Development of regional support teams	100%	
Develop a communications and transmission staff function	95%	5%
Develop and information gathering and assessment staff function	95%	5%
Automate response of incident support teams	86%	14%
Develop a personnel an administration staff function	85%	15%
Develop computer based command checklists	81%	19%
Develop Partnerships with nontraditional organizations such as private corporations or clubs	76%	24%
Move the command post to a fixed off site facility	38%	62%
Provide less structure and allow more creativity	20%	80%

Number of respondents = 21

A review of the data presented in the question indicates that respondents are open to the adoption of eight out of the ten concepts listed. This indicates the majority of respondents are open to the introduction of new ideas, and they believe that most of the concepts listed could enhance NIMS. Adoption of the concepts positively selected by the respondents would alter NIMS in the following ways:

- Place an enhanced focus on the importance of information to decision making during emergency response with designated analysis teams;
- Automate the response of support teams;
- Alter staff functions to create separate functions for communications and information assessment;
- Create nontraditional partnerships with NGOs and other infrequently utilized agencies;
- Increase the use of automated decision aids.

Respondents indicated these concepts have the potential to enhance American ICS. The respondent's willingness to adopt these concepts serves as an indicator that ICs have identified the need for change, innovation and improvisation when dealing with the response to surge incidents. Extreme events produce unforeseen problems and conditions requiring adaption, improvisation and creativity to deliver services under extreme conditions. In these rare cases, discipline that includes structure, doctrine and process must be balanced the creativity, improvisation and adaptability.¹²⁴ In these novel situations, there is a tradeoff between the command and control necessary for mobilization and the need to ensure broad coordination and communication.

If these concepts were adopted NIMS would be reshaped into a more agile system. A new focus would be placed on the value of information and the need for increased internal and external communications. The response of support teams would be automated and incorporate both local and regional personnel. Uniform decision aids would be deployed, along with the training necessary to properly use these tools. Command operations would become more open to the inclusion of nontraditional partners and NGOs. Disturbing the

¹²⁴ John R. Harrauld, Josep Barbera, Irmak Renda-Tanali, Damon Coppola, and Gregory L. Shaw. *Observing and Documenting the Inter-Organizational Response to the September 11th Attack on the Pentagon*. Washington, DC: The George Washington University, Institute for Crisis, Disaster and Risk Management, 2002, 261.

command ecosystem through the implementation of these concepts would produce both benefits and concerns, which are listed below:

2. Potential Benefits of Adoption

- A consistent set of decision aids and tools would be provided to responders;
- Training would become more intense and formalized;
- The Depth of command resources would be increased;
- The quality of information analysis would be improved;
- Formalized support teams that regularly work together would be created;
- Communications would become a specialty.

3. Potential Concerns of Adoption

- As many of these efforts would require regional response, some autonomy would be relinquished at the local level;
- Training time and intensity would dramatically increase;
- The cost of providing this level of training and the availability of response resources and decision aids would be significant.

H. INNOVATION AND CREATIVITY

1. Ideas to Enhance the Ability to Cope with Unfamiliar Situations

Although the previous survey rounds asked respondents to identify their ideas for coping with unfamiliar events, this final segment of the Round Three survey provided an additional opportunity to reflect on the entire process and provide additional creative insight into concepts and ideas that could enhance decision making during the initial response to surge incidents. Sixteen (76 percent) participants answered this question and five (24 percent) participants skipped this question. The respondents cited nine concepts that focused on

improving the Incident Commander's ability to cope with unfamiliar situations. These ideas are outlined from highest to lowest frequency of response. A breakdown of this analysis is detailed in Table 30:

Table 30. Creative Ideas to Cope with Unfamiliar Events

Creative Ideas to Cope with Unfamiliar Events	Frequency of response
Training in nontraditional problem solving methods	5
Increased training and exercises	4
Structured review of lessons learned from surge incidents	4
Create support teams	4
Assign an aide to command positions	2
Computerized job aides	1
Bottom up ICS focus	1
Build expanded relationships	1
Create mobile dispatch operations to reduce radio traffic	1

Number of respondents = 16

Responses indicate a continuing focus on training. However, the training requested is nontraditional in that it has little to do with the fire services and is more about the development of new problem solving techniques. As an example, the application of business or military problem solving models could prove to add value and expand the methods available to responders. Respondents indicated that additional consideration should be given to the value of information garnered from those that have experienced the unique aspects of surge incidents. As an example, a class pertaining to ambulance mobilization that was delivered in July 2012, by the author, utilized the radio traffic from the Century Theater Shooting in Aurora, Colorado as means to present the value of the experience gained by others who have experienced the unique nature of surge incidents. The development of additional support resources such as the creation of formalized support teams was another popular concept that indicates respondents believe

that the current level of support resources is insufficient when compared to the response needs produced by surge events. The following two quotes illustrate these points:

Our problem solving techniques are based on our training and knowledge at surge events. I believe that we need to educate ourselves and learn to solve problems using nontraditional methods.

We need to develop leadership skills through training but not just through fire service training. We need to include other fields and open our minds.

I. CONCLUSION

A review of the analysis of Round Three of the Delphi process indicates that increased emphasis needs to be placed on the dominant themes of: increased training, building awareness, and exercising strategic plans. It is these second and third tier mutual aid plans that were repeatedly identified as the foundation of success when addressing the response demands associated with surge events. Adaptive and creative concepts for coping with surge events have emerged through personal innovation, networked relationships and informal support activities. Many of these methods have developed based on lessons learned from the experience of the response to chaotic surge incidents. The collective experience of the Delphi panel has provided unique insight often developed during the response to expanding surge incidents.

This thesis provides an inventory of ideas for commanders to consider. Informing commanders with a new level of options remains a primary goal of this thesis. Several respondents indicated that they would consider many of the concepts presented that they have never utilized. As the majority of respondents indicated that they were open to the adoption of concepts that would enhance operational effectiveness, this suggests that sharing this information can provide commanders with a toolbox of additional options to consider as they face nonroutine events.

Formalizing and automating support response was a theme that reiterated through several questions. Respondents saw a clear need to increase the depth of support response using both experienced Chiefs from nearby regions and specific experts outside of traditional response groups. Throughout the survey process, the need for enhanced situational awareness was presented, respondents support the concept of making the development of situational awareness a new assignment or staff function within the incident management system.

Although NIMS provides operational structure, respondents endorsed the adoption of several concepts extracted from the German IMS system known as DV 100. Respondents were also open to the integration of new technologies and leveraging nontraditional resources, such as contact with experts as essential components of success when facing incidents that have progressed into the chaotic context. Despite the wide level of support for the adoption of technology, the need to provide a written guide and operational documentation as a backup was also expressed.

Several responses indicated that the fire service should be exposed to training on nontraditional problem solving techniques from other disciplines. An example of this concept would be to review the strategies employed by FedEx in moving packages and then considering the application of these techniques to resource deployment in the fire service. This survey presented several innovative and creative ideas that have the potential to assist commanders, as they approach the dangers of the unfamiliar. An integrative review of the findings and recommendations is presented in Chapter VII.

THIS PAGE INTENTIONALLY LEFT BLANK

VII. FINDINGS AND RECOMMENDATIONS

Coming together is a beginning, staying together is progress, and working together is success.

—Henry Ford

A. INTRODUCTION

As an emergency incident develops, command structures are formulated to direct resources. During routine events, experience, intuition, patterns and cues are utilized to make strategic decisions. When formulating an operational plan during routine events, the majority of Incident Commanders function as experts and use perception, comprehension and projection to identify the potential ramifications of the unstable situation. Surge events are defined as emergency incidents that require resources well beyond normal operating capacity and become complex and chaotic. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism related events. Thankfully, disasters of this magnitude are rare but can be of such a magnitude that the Incident Commander is confronted with a unique situation that often exceeds the commander's experience and ability to improvise and adapt to changing conditions.

This thesis utilizes a Delphi survey methodology to obtain the perspective of experienced Incident Commanders to identify the signals that an incident is becoming nonroutine and unfamiliar, inventory decision-making methods during unfamiliar events, and identify strategies that have the potential to enhance decision making. This thesis identifies best practices and inventories strategic options that can assist Incident Commanders, as they are faced with fast moving, unpredictable and ever-changing crises. The knowledge obtained through this research will enhance the ability of Incident Commanders to make effective decisions when lives are most at risk.

This thesis addresses the research questions: “As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate that a different method of decision making is necessary?” and “What strategies can be utilized to enhance decision making during the initial response to chaotic surge incidents?” Secondary questions guiding the research include:

- How are decisions made during the initial response to asymmetric incidents?
- As emergency incidents expand toward the chaotic context, what signals indicate that an event is becoming nonroutine, unfamiliar and chaotic and which of these signals is the most important?
- What strategies can be utilized to enhance decision making during the initial response to chaotic surge incidents?
- How important is information management and situational awareness during the response to surge events?
- What decision aids can enhance confidence and capacity on the incident scene?
- How can NIMS be adjusted to be more effective?
- How can second and third tier mutual aid be improved?
- How can the value of informal support networks be strengthened?
- What comparative command practices should be considered for adoption in the United States?
- What innovative and creative ideas to enhance decision making during the initial response to surge events should be considered?

This study used a Delphi survey to illicit responses from CFOs who are either graduates of the National Fire Academies (NFA) Executive Fire Officer Program (EFOP) or participants in the Massachusetts Fire Incident Reporting System (MFIRS). The Delphi survey included both quantitative and qualitative questions. Quantitative questions sought the identification of statistical information and rated of the importance of signals and the frequency of command staff assignments. Qualitative questions included requests to identify

important signals, inventoried adaptive strategies and considered options to manage information. Data has been analyzed and summarized to address each of the research questions listed above.

This chapter presents the Delphi survey results, relates these results to the background and context of the problem and literature on decision making during emergent events, and proposes recommendations. This study began by reviewing the background of command decision making at asymmetric incidents and reviewing the literature on decision-making methodologies, collaboration, and geospatial technologies. This analysis informed the development of survey questions.

A three round Delphi survey was created and distributed to 32 CFOs, as described in Chapter VI. The first round questions were framed to identify signals that indicate that an emergency is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic and to identify the adaptive decision-making methodologies used in these situations. The second round of the Delphi survey was informed by the results of the first. It concentrated on ranking the relative importance of signals identified in round one and listing concepts that would improve strategic decision making during the initial response to surge incidents. The third round of the Delphi survey, built on the results of the first two rounds. It consisted of questions that addressed three broad categories including the identification of concepts that contribute to value and/or the effectiveness of operations, identifying the frequency that identified themes are utilized, and gauging the receptivity to implementation of IMS components from other models.

The research question findings are presented below, followed by short and long-term recommendations for action and directions for future research in the area of command decision- making.

The major findings from this study were:

- Decision making during emergency operations relies on both situational and personal factors. On the personal level, experience,

patterns and cues form the basis for decisions. Situational factors include the extent of situational awareness, resource availability, command capability and the capacity for collaboration. In this context the seasoned expert in routine situations can transition to a novice when faced with unfamiliar incidents that often exist in the chaotic context.

- This project identified 18 themes that signal the transition from the routine toward the unfamiliar. Examples of dominant themes include: compromised safety on the incident scene, a lack of sufficient information or situational awareness, strained command structure, lack of progress controlling the situation and a lack of sufficient resources to match the scope and magnitude of the incident. The presence of these themes can inform ICs that an incident is becoming emergent. This knowledge can produce an anticipatory strategy that has the potential harness a higher level of situational awareness and produce a more effective response effort.
- A variety of strategies to deal with the unexpected exist within the complex adaptive IMS system. This thesis created an inventory of possible strategies that can broaden the preparatory and response based options of ICs. The Delphi survey process indicated that responders have a high receptivity to adopting concepts that they have not previously utilized.
- Surge events present unanticipated conditions and problems requiring creativity, collaboration and innovation while demanding the rapid delivery of services under adverse conditions.
- There is a tradeoff between command and control required for mobilization and then collaboration, coordination and communication necessary to craft an appropriate response to surge incidents.

B. RESEARCH QUESTION FINDINGS

This section provides the findings of the study's research questions. A secondary question that developed through the review of literature is presented first, followed by findings to the overarching research questions **"As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate that a different method of decision making is**

necessary?” And “What strategies can be utilized to enhance decision making during the initial response to chaotic surge incidents?”

- How are decisions made during the initial response to asymmetric incidents?

The high-risk, time-sensitive environment of emergency response requires commanders to take immediate action. Typically, commanders use a naturalistic decision-making process that harnesses the lens of previous experience as a foundation for action.¹²⁵ As an incident evolves, experienced experts use the concept of rapid cognition to filter extraneous information and zoom in on aspects of the situation that really matter.¹²⁶ Recognition Primed Decision-making (RPD) allows the expert to identify the presence or absence of familiar patterns and cues and then use this comparative information as a foundation for action.

The literature shows that novel events often exist within the chaotic context of the Cynefin Framework.¹²⁷ First responders confront the challenge of responding to unique and often unfamiliar events with a lack of both exposure and experience.¹²⁸ In the absence of experience, the expert who is well versed in dealing with the routine can transform into a novice when dealing with the unexpected. Novices tend to react and often revert to the comfort of applying familiar strategies to unfamiliar events. This principle was demonstrated within the research as respondents identified symptoms relating to their inability to use expertise to manage these unique situations. Examples of these symptoms include: the presence of a strained command structure, personnel that are

¹²⁵ Roberta Calderwood, , Beth W. Crandall, and Gary A. Klein. *Expert and Novice Fire Ground Command Decisions*. Yellow Springs, OH.

¹²⁶ Malcolm Gladwell, *Blink: The Power of Thinking Without Thinking*. New York: Little, Brown and Company, 2005. 147.

¹²⁷ David J. Snowden and Mary E. Boone, "A Leader's Framework for Decision-making: A Leader's Framework for Decision-making." *Harvard Business Review* 85, no. 11 (November, 2007): 68–76.

¹²⁸ Neil R. Hintze, "First Responder Problem Solving and Decision-making in Today's Asymmetrical Environment." Master of Arts in Security Studies (Homeland Security and Defense), Naval Postgraduate School, 2008, V.

overwhelmed, lack of sufficient information, commanders that are managed by the incident, loss of responder composure, and a deterioration in teamwork.

An extreme event can produce unforeseen problems and conditions that require the application of creativity, improvisation and adaptability. As the intense psychological pressure of the response to novel events often shuts down the part of the brain responsible for creative and innovative thought, commanders must balance the structure and rigidity of NIMS with the agility needed to adapt and collaborate when facing the unexpected.¹²⁹

- As emergency incidents expand toward the chaotic context, what signals indicate that an event is becoming nonroutine, unfamiliar and chaotic and which of these signals is the most important?

This study sought to identify signals that an incident is or has transitioned toward the nonroutine. Delphi panel participants were asked to identify the signals that an emergency is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic. The survey process identified 18 themes that ranked as either very important or somewhat important. These themes are listed below:

- Safety compromise (loss of accountability, mayday, victim/firefighter injury)
- Lack of progress (situation escalates, unable to complete assignments)
- Strained command structure (lack of structure, unable to manage roles)
- Communications strain/breakdown (interoperability, radio system overload)
- Lack of sufficient information (situational analysis)
- High risk decisions (risk based analysis)

¹²⁹ Jeff Weiss and Jonathan Hughes, "Want Collaboration? Accept-and Actively Manage-Conflict." *Harvard Business Review* 83, no. 3 (March, 2005): 93–101.

- Insufficient resources (loss of span of control)
- Lack of teamwork (freelancing)
- Overwhelmed (anxiety or confusion)
- Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, reporting volume not matching)
- Managed by the incident (reactive nature emerges)
- Command inundated with information (external concerns, requests for information)
- Multiple decision points/priorities (multiple operational sites/incidents)
- Loss of responder composure (paralysis, frustration, errors)
- Complex operations/structure (need to collaborate)
- Need to redeploy resources (defensive posture)
- Sense of urgency (intuition, voice modulation)
- Time expectations exceeded

The survey process further refined this consensus-based inventory of signals to identify the five most important themes. The five most important signals include; safety compromise, the lack of sufficient information or situational awareness, strained command structure, lack of progress mitigating the incident, and insufficient resources. These signals provide a series of indicators that can inform Incident Commanders when an incident is becoming emergent. Additional research should be conducted to further explore the concept of signal recognition, as this inventory is not presented as an exhaustive list.

The absence of expected signals was another concept explored through this research. Respondents identified that the absence of three expected signals would indicate the emergence of an unfamiliar situation. These missing signals

include the absence of expected incident progression, a lack of critical communications, and the lack of engagement of crews indicating that personnel do not know what actions they should take.

A lack of knowledge and recognition of the importance of these signals can lead to disaster. The Delphi process indicates that ICs share only a minimal level of knowledge pertaining to these signals. Providing ICs with an inventory of these signals provides a point of reference and a level of knowledge that may enhance decision making during the response to surge events.

- What strategies can be utilized to enhance decision making during the initial response to chaotic surge incidents?

The literature indicates that creativity; adaption and improvisation are essential aspects of success when confronting novel surge events.¹³⁰ Decision making in complex environments requires a high level of situational knowledge, information sharing and collaboration. Collaborative capacity is the collective ability of a networked team to collect, synthesize and prioritize information essential to managing events within the unordered context of the Cynefin Framework.¹³¹ Partnerships, including multi-agency and public-private coalitions, are a growing reality and an adaptive way to face the growing complexity of emergent threats.¹³²

When facing unfamiliar and unpredictable incidents, the majority of survey respondents indicated they would alter their decision-making strategies. Altered strategies included increasing collaboration by seeking the opinion of experts or those with experience, assigning additional personnel to coordinate activity as

¹³⁰ John R. Harrauld, "Agility and Discipline: Critical Success Factors for Disaster Response." *The Annals of the American Academy of Political and Social Science* 604, no. 1 (March, 2006): 256–272.

¹³¹ Snowden, *A Leader's Framework*, 68–76.

¹³² Robert Klitgaard and Gregory F. Treverton, *Assessing Partnerships: New Forms of Collaboration*. Washington, DC: IBM Endowment for the The Business of Government, 2003.

command functions expand, moving toward a defensive strategy that ensures the safety of responders, verifying information, and maintaining a risk vs. gain approach.

This thesis developed an inventory of possible strategies that can be employed to confront asymmetric situations. Informing commanders of these concepts provides a range of tools that can be considered as incidents become chaotic or nonroutine. Specifically, strategies that should be considered to match the scope and magnitude of chaotic events include the following:

- Preplan, anticipation of probable events; activation of plans
- Prioritize actions toward immediate needs (deployment of limited resources, focus on achievable goals)
- Call for additional resources early (more than needed)
- Expand ICS Structure, delegate responsibilities, empower personnel
- Break the incident into manageable segments; adjust the length of operational periods
- Construct options (multiple game plans)
- Constantly seek updated situational awareness
- Focus on macro view
- Integrate external agencies—nontraditional roles
- Develop communications structure to match the incident
- Use informal support of local chief officers
- Confer with colleagues
- Remain calm—influence on others
- Establish time checks from dispatch center

Other tactical actions include consideration of actions that will enhance operational capacity or reduce distraction and interference on the incident scene. These ideas include the assignment of an aide to assist the IC, developing written plans and checklists to track activity, moving the command post away from the incident site, conducting regular briefing sessions for first responders, limiting radio traffic, verifying the credibility of information, and assigning a Public Information Officer (PIO) to manage press briefings away from the command post. Respondents indicated a high level of potential adoption of strategic options they had not previously considered. These command methods provide an arsenal of strategies that can be considered as commanders face the unfamiliar. Although this strategic inventory can provide the IC with a series of tools to consider, these are not a singular solution as a high level of knowledge, skill and ability is essential to match these options to the scope and magnitude of the asymmetric incident.

The research process revealed the most immediate assistance in confronting surge events resides on the regional level or second tier of the mutual aid system. The regional level is composed of informal interagency associations that often self-organize to optimize services. Given the informal nature of these associations, programmatic action is based on a series of situational and personal factors. As personal factors include personalities and relationships, the absence of consensus can produce a substantive barrier that can stifle change. Regional solutions are attractive based on proximity, resource depth and the propensity for command officers to self-organize through regional associations. Regional assets include the ability to access resources through mutual-aid plans, the relationship-based response of local CFOs to support command, and the integration of external agencies. Simulation-based training, and training on the implementation of response plans, was discussed as a critical success factor that complements operations at the regional level.

- How important is information management and situational awareness during the response to surge events

Decision making in the high stress environment of emergency response is subject to time pressure, significant uncertainty, and life safety concerns. Considering these factors, a high level of situational awareness is directly linked to operational success.¹³³ Situational awareness is the art of understanding your surroundings while developing perception, comprehension and projection. Situational awareness empowers the IC to make sense of a situation and anticipate shifting conditions.¹³⁴ Multiple agencies are frequently involved in the response to complex incidents, a potentially dangerous consequence is that critical information is “Stovepiped” or constrained by organizational boundaries based on organizational culture and a lack of collaboration.¹³⁵

Often, the level of information directed toward the IC during a crisis is overwhelming. Survey respondents were asked how they filter and manage the vast amount of information inherent to emergency operations. These information management concepts have the potential to expand the options considered by commanders, as they face emergent incidents. These ideas are listed below:

- Expand ICS Structure, delegate responsibilities, empower personnel
- Utilize an aide, liaison, scribe, communications specialist
- Document plans, checklists
- Break incident into manageable segments
- Use informal support of local chief officers
- Security, isolation of command post

¹³³ U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *Situation Awareness and Decision-making in a Warning Environment*. Advanced Warning Operations Course, IC Core 2, Lesson 2 Individual SA Warning Decision Training Branch. Washington, DC: National Oceanic and Atmospheric, 7.

¹³⁴ Joseph W. Pfeifer, "Command Resiliency: An Adaptive Response Strategy for Complex Incidents." Master of Arts in Security Studies (Homeland Security and Defense), Naval Postgraduate School, 2005, 18.

¹³⁵ Ibid., 16.

- Conduct regular internal briefing sessions
- Confirm credibility of information
- Assign public information officer – conduct press briefings away from the command post
- What decision aids can enhance confidence and capacity on the incident scene?

Chaotic events tend to increase the level of communication and enhance cohesion based on shared interdependence. Decision aids can enhance the development of a high level of situational analysis by organizing data, building a common vision, and filtering information to promote effective decision making. Respondents were asked to identify decision aids that would enhance both the confidence and capacity of decision making during asymmetric events. The development of aerial reconnaissance was the top selection, as this technology offers a macro perspective of evolving conditions that are often elusive on the incident scene. Using sensors embedded with crews operating in remote areas provides a micro perspective of the conditions and serves as a mechanism to evaluate conditions in an area of operation and a means to enhance the safety of operating personnel. These technologies have the potential to enhance operations and enhance decision making as incidents expand into the chaotic context.

The development of job aids can enhance decision making provided that common expectations have been set through training. Presently most fire service organizations use a number of different and often incompatible job aids. To be effective in a multiagency/multidiscipline response consistent job aids need to be employed as the foundation of a higher level of shared knowledge.

The value of job aids was tempered by perceived cost relative to perceived benefit. This cost benefit criteria dramatically changed the results and pushed the top priority for the development of job aids away from costly nontraditional technologies such as aerial reconnaissance. When considering the

priority of investment, respondents ranked training, automated response of support personnel, computerized checklists, and systems that track the location of firefighters as top investment priorities. Other ideas for decision aids include the development of written guides as a backup in case of the technological failure, access to experts, increased exercises, and increased networking opportunities.

- How can NIMS be adjusted to be more effective?

Harrald indicates that expertise is not a singular solution, as a balance of both agility and discipline are required to successfully mitigate emergency incidents. Agility includes the ability to innovate through NIMS, which is typically considered to be a closed and rigid system.¹³⁶ Surge events produce unforeseen problems and conditions requiring adaption, improvisation and creativity to deliver effective services under extreme conditions.

A slight majority of survey respondents felt that NIMS is an optimal IMS model, while others felt it could be improved. Proponents indicated that NIMS is a standard tool that is utilized across America, and this standardization generates a common level of knowledge and comprehension when dealing with agencies that rarely work together. Others felt that NIMS is a scalable system that provides structure, and they believe that NIMS breaks the incident into manageable pieces while ensuring resource control and information flow. However, just under half of the respondents that felt NIMS is not the optimal model viewed NIMS as a rigid system that is not well suited for all incidents.

NIMS is the universal IMS system utilized in the U.S. Although changes to NIMS can produce agility, caution needs to be exercised to avoid the development of divergent systems. Emphasis should be placed on the optimizing

¹³⁶ John R. Harrald, Joseph Barbera, Irmak Renda-Tanali, Damon Coppola, and Gregory L. Shaw. *Observing and Documenting the Inter-Organizational Response to the September 11th Attack on the Pentagon*. Washington, DC: The George Washington University, Institute for Crisis, Disaster and Risk Management, 2002.

response at the regional level and then introducing best practices into NIMS to promote broad adoption of these best practices.

- How can second and third tier mutual aid be improved?

The crux of developing a response that matches the scope and intensity of surge events lies within the ability to engage the resources organized through second (regional) and third (state) tier mutual-aid plans. The literature indicates that this interdependence creates a shared purpose and the determination of a joint mission. Survey respondents provided a series of responses relative to how best to improve the effectiveness of these mutual-aid plans. Concepts identified focused on increasing training and simulations, building awareness of existing plans, and providing a resource and inventory status system. Respondents indicated that a system deficit is the relative infrequency of use. The automation of response was a dominant research theme that would enhance operational capability by increasing familiarity with second and third tier systems based on a higher level of utilization.

The Federalist principles prevalent within the U.S. provide a strong level of local autonomy. Automation reduces some of that autonomy and introduces regional response assets. Responders need to focus on supporting the local IC and be careful not to produce a threatening environment by taking actions that would disturb the local IC.

- How can the value of informal support networks be strengthened?

Survey responses consistently demonstrated that an informal and often relationship-based support from local CFOs was a critical aspect of developing an effective response to surge events. Based on proximity, this second level of command resources is the most immediate support that is available. Social aspects, such as the power of relationships and personalities, should not be underestimated as the foundation of collaboration. Hocevar et al. noted that the personal aspects of collaboration are often attained through a personal touch, a

handshake and a smile.¹³⁷ The literature indicates that the ability to leverage collaboration is built on trust, respect, dependability, and previous relationships. Interdependence often leads to the formation of emergent teams. A collaborative approach creates an environment that supports intelligent improvisation, which may lead to new strategic options and solutions.¹³⁸

Respondents provided insight into the best methods to enhance the value of the informal response of CFOs. This guidance includes formalizing response plans to include the automated activation of a support team of local CFOs, allowing participants to opt in rather than being forced to respond or accept assistance, providing role specific training, creating documentation relative to expectations, and developing opportunities to broaden networking relationships.

Informal support was viewed by the Delphi panel as the backbone of success during the first operational period of surge events. The relationships formed through informal support networks are fragile. Therefore, responders need to focus on customer service as they work for the local IC. The value of relationships should not be underestimated as a single negative experience can produce regional ramifications.

- What comparative command practices should be considered for adoption in the United States?

Often, the opportunity for productive change comes from beyond our own lens of experience. This study considered the perspective and practices utilized within the German IMS system DV 100.¹³⁹ This comparative evaluation unearthed ten concepts that have the potential to alter NIMS in an effort to enhance effectiveness and efficiency. Respondents indicated a high level of

¹³⁷ Susan P. Hocevar, Gail F. Thomas, and Erik Jansen, "Building Collaborative Capacity: An Innovative Strategy for Homeland Security Preparedness." In *Advances in Interdisciplinary Studies of Work Teams*, edited by Michael M. Beyerlein, Susan T. Beyerlein and Frances A. Kennedy. Vol. 12, 255-274: Emerald Group Publishing Limited, 2006.

¹³⁸ John R. Harrald, *Agility and Discipline*, 261.

¹³⁹ Führung und Leitung im Einsatz – Führungssystem, "Leadership and Command in Emergency Operations." DV 100. 12 20, 2007. 43.

interest in adopting eight of the ten concepts presented. Practices to consider include reorganizing staff functions to better match the needs of an event, focusing on the importance of situational awareness, development of support teams, development of technology to assist in command functions, creation of nontraditional partnerships, and the automation of the response of support resources.

These concepts have the potential to enhance response efforts and produce a more agile IMS. The agility produced needs to be slowly developed and balanced with the discipline and structure of NIMS. Aspects of comparative analysis produce opportunities that can become liabilities if not properly implemented.

- What innovative and creative ideas to enhance decision making during the initial response to surge events should be considered?

Innovation and creativity leads to the adaptive ability to solve unfamiliar problems. Respondents presented two new ideas. First, providing training to commanders in the art of nontraditional problem solving received the highest level of respondent interest. This suggests a willingness to look to other disciplines for ideas that could be applied on the emergency scene.

As an example, FedEx is a leader in the logistics of moving packages in a timely and efficient manner. One strategy employed by FedEx is the use of hubs where packages are gathered and then sorted for bulk delivery. This business practice optimizes efficiency and may have applications in the management of large volumes of patients in need of medical transport to appropriate facilities that often occurs during the response to Mass Casualty Incidents (MCIs).

Venturing beyond traditional learning venues can provide new perspective. These ideas need to be carefully considered as a change can often produce second and third level effects. Reflecting on the example above, using FedEx's logistical expertise should not be pursued, if the secondary effect of decreased patient care would result.

Second, developing and publishing a review of lessons learned at novel events could continue the inventory of knowledge initiated by this thesis. This strategy provides commanders with an inventory of strategic options that could prove helpful, as they face the unfamiliar landscape of asymmetric incidents.

C. IMPLEMENTATION OF INCIDENT CONTROL STRATEGIES

Change is the law of life. And those who look only to the past or present are certain to miss the future.

—President John F. Kennedy

Leaders are architects, assimilators, and facilitators of strategic change. Implementation occurs when an individual or group puts an innovation to use. This involves a process that considers collaboration, consensus and culture and then utilizes networked relationships to make a decision relative to the best path. Implementation is the overt behavior that puts ideas into practice.¹⁴⁰

This thesis identifies several ideas that if broadly adopted could enhance decision making during the first operational period of surge events. These ideas are disruptive, as they represent substantive change; and as such, the approach to implementation is a critical success factor that constitutes the difference between considering a theory and producing tangible results. As an example, the Delphi panel agreed that aerial reconnaissance was a job aide that could enhance situational awareness. If this concept was implemented without both consensus and appropriate training, it could be viewed as a threat to autonomy that would create a reaction that would impede adoption.

The unique aspects of the nature of informal associations that are the key to successful consideration and adoption of change make the approach to implementation a critical success factor. Regional associations have developed as a tool for synergy and adaption to the ever-changing environment of the public

¹⁴⁰ Everett Rogers, *Diffusion of Innovations*. New York, New York: Free Press, 2003.

sector. As commanders self-organize on a regional level, these associations form the backbone of fire service collaboration in the United States.

Complex systems are comprised of groups of adaptive agents whose interactions result in complex nonlinear dynamics, the results of which produce emergent phenomena.¹⁴¹ The hallmark of these complex adaptive systems is emergence and the informal cultural power to lead change.

Meadows indicates that we live in a world of complex interconnected systems.¹⁴² Evolving collaboration through regional entities stands as an example of the interconnected nature of the American Fire Service. Change involves an attempt to alter the current way of thinking and acting by the organization's membership; this enables groups to take advantage of opportunities to cope with environmental threats. Management by Values (MBV) is a strategic leadership tool that can help redesign organizational culture and prepare them for the future.¹⁴³ Shared beliefs and values provide an important key to understanding and facilitating human conduct in groups. Values are structures of thought that encompass complex ideas about the reality desired by people. Values have the capacity to transcend perception of what exists and conceptualize a positive vision of the future. The conception of a positive future serves as the foundation of change.¹⁴⁴

Everett Rogers developed the innovation life cycle that starts with the impetus for change being disruption. As the environment is disrupted, innovations are considered and adopted, as outlined in Figure 8. Once adopted,

¹⁴¹ J. Brownlee, "Complex Adaptive Systems." *Complex Intelligent Systems Laboratory, Centre for Information Technology Research, Faculty of Information Communication Technology, Swinburne University of Technology: Melbourne, Australia* (2007).

¹⁴² Donella H. Meadows, and Diana Wright, *Thinking in Systems: A Primer*, edited by . Translated by , edited by . White River Junction, Vt.: Chelsea Green Pub., 2008.

¹⁴³ S. L. Dolan and S. Garcia, "Managing by Values: Cultural Redesign for Strategic Organizational Change at the Dawn of the Twenty-First Century." *Journal of Management Development* 21, no. 2 (2002): 101–117.

¹⁴⁴ Dolan, *Managing by Values*, 101–117.

these changes eventually become routinized and slowly blend into the tradition and culture of the organization. This cycle is detailed below:



Figure 8. Everett Rogers Innovation Life Cycle (From Everett Roger Diffusion of Innovations 2003)

As organizations struggle to make sense of changing internal and external environments culture is a key factor in identifying the obstacles to implementing innovation. Organizational culture is associated with collective cognition and shared beliefs; these are reflected in the traditions, habits, stories, and symbols of the group.¹⁴⁵

These shared beliefs encourage consistency in organizational behavior and produces a predictable resistance to change demonstrated in Figure 9. Adoption of change is a process of managing risk.¹⁴⁶ Change moves people and organizations beyond the comfort of the status quo into the realm of the unknown, this disruption is unsettling and causes personal reactions that range from enthusiasm to combativeness. Management of these reactions and knowledge of the process of innovation adoption is essential to the successful implementation of strategic change. Everett Rogers developed the adoption

¹⁴⁵ Henry Mintzberg, Bruce W. Ahlstrand, and Joseph Lampel, *Strategy Safari: A Guided Tour through the Wilds of Strategic Management*, edited by . Translated by edited by New York: Free Press, 1998.

¹⁴⁶ Evertt Rogers, *Diffusion of Innovations*. New York, New York: Free Press, 2003.

curve in 1995. This curve explains how change progresses slowly at first through the actions of innovators. Social influence then contributes to a wider adoption that gains momentum as others move toward adoption. Despite this domino effect, some laggards continue to resist as they cling to the status quo of the past. This process has been outlined in Figure 9:



Figure 9. Everett Rogers 1995 Adoption Curve (From Everett Rogers Diffusion of Innovations, 2003)

Managers need to address the cultural context as a mechanism to produce and sustain strategic change.¹⁴⁷ If culture defaults to the status quo, this bias can blind managers to changing external conditions, as they tend to stick with beliefs that have worked in the past.¹⁴⁸

Consensus is another key aspect of implementation; collective agreement enables one to cope with uncertainty and rapid change.¹⁴⁹ Consensus building is a way to search for feasible strategies for dealing with conflict. Stakeholders with a variety of interests often come together to dialogue about policy issues or common concerns. Collaboration can break logjams and incorporate many interests producing mutual gain and the potential of higher levels of performance.¹⁵⁰

¹⁴⁷ G. Johnson, "Managing Strategic Change—Strategy, Culture and Action." *Long Range Planning* 25, no. 1 (1992): 28-36.

¹⁴⁸ Mintzberg, et al., *Strategy Safari*.

¹⁴⁹ Judith Eleanor Innes and David E. Booher, *Planning with Complexity: An Introduction to Collaborative Rationality for Public Policy*, edited by . Translated by , edited by . Milton Park, Abingdon, Oxon ; New York, NY: Routledge, 2010.

¹⁵⁰ Ibid.

Consensus building has emerged as an important method of deliberation that has produced agreements, innovations, social policy, and intellectual capital among previously warring stakeholders.¹⁵¹ Consensus building and other forms of collaborative planning can help to resolve social and political fragmentation, shared power and conflicting values. Collaboration is not only about producing agreement but also about experimentation.¹⁵² Consensus can establish new or stronger personal and professional relationships and build trust that facilitates joint communication and problem solving. Through an atmosphere of trust, Consensus can lead to a higher level of learning and creativity.

Implementation is a complex and evolving process that changes as the organization overcomes challenges. Through the shared experience of building consensus, facts are explored and a shared reality is created. This shared reality becomes the basis for action and ultimately leads toward implementation.

This thesis has drawn on the wisdom of experienced ICs to identify innovations and best practices that, if adopted, more broadly would enhance the effectiveness of operations during the first operational period of surge events. Implementation of these concepts is the key to making a substantive difference on the incident scene. As change is often a difficult and transformative process, consideration needs to be given to how to move the ideas generated through this research into action. Emergency response is a complex and interconnected system that links intra and interdisciplinary response agencies with NGOs to optimize response efforts and maximize public value. This complex environment requires that innovation be paced to match the tolerance of these interconnected relationships.

The Delphi panel identified regional associations as the workhorse of change that could disrupt the environment and ultimately influence the practices

¹⁵¹ Judith Eleanor Innes and David E. Booher, *Planning with Complexity: An Introduction to Collaborative Rationality for Public Policy*, edited by . Translated by , edited by . Milton Park, Abingdon, Oxon ; New York, NY: Routledge, 2010.

¹⁵² Ibid.

associated with NIMS. As an example, many of the survey respondents indicated that the informal support offered by local CFOs is the first line of command support available. The majority of Delphi participants reached consensus that this level of support should be formalized and automated. As this support is often relationship-based, change must be based on regional consensus. Rushing into this process or ignoring the need for collaboration would create an innovative disruption destined for failure. Considering the adoption process and the need to strategize the implementation of the concepts identified in this thesis is the cornerstone of adoption.

D. ITEMS FOR ACTION / IMPLEMENTATION AND CHALLENGES

The response to complex and chaotic events remains a difficult task. The purpose of this thesis was to provide ideas that can be utilized by ICs as the face of the challenges of response to asymmetric surge events. The action items identified below were developed from the research findings.

1. Short-term Proposals and Considerations

Enhancing decision making during the first operational period of surge events is centered on the optimization of local and regional resources that are in proximity to be rapidly deployed. This observation creates an opportunity for action that can produce tangible results through strengthening collaborative efforts. Augmenting a commander's strategic inventory has the potential to create a vision of a shared approach to the unique problems created by surge incidents.

Specifically, the following actions should be considered at the regional level:

- Develop an educational component that summarizes the findings of this study to be presented at regional meetings of CFOs as a means to generate discussion;
- Provide CFOs with an inventory of the strategic concepts presented within this thesis;

- Identify the action items that are easily accomplished as a means to create forward momentum;
- Appoint a focus group to make recommendations for action;
- Pursue actions based on a consensus process;
- Utilize short-term success as a springboard to continue to develop strategies that enhance decision making during the first operational period of surge events.

2. Long-term Proposals and Considerations

In the long term, regional response concepts should be augmented by a greater effort to annunciate lessons learned from the response to surge events and project best practices through state and national level training opportunities. Additional actions should focus on the update of NIMS and continued development of interagency coordination systems. Specific recommendations follow:

- Identify examples of best practices in developing response resilience;
- Provide commanders with a periodic training opportunity that focuses on the challenges and stressors associated with command;
- Publish information that outline lessons learned;
- Develop a monthly column in a respected fire service periodical that focuses on broadening one's lens of experience based on lessons learned from disaster response;
- Work with the USFA to develop interactive simulations that focus on strategic command decision making;
- Develop nontraditional problem solving training that can be applied to public safety operations;
- Revise NIMS to include the flexibility to embrace creativity, innovation and improvisation during the response to nonroutine situations.

Moving theory into practice is a challenging and methodical process that needs to be guided by leadership. Meta-leaders are those individuals whose scope of thinking, influence, and accomplishment extends far beyond their formal or expected bounds of authority. The following quote highlights the need for leaders to inspire others:

If your actions inspire others to dream more, learn more, do more and become more, you are a leader.

—John Quincy Adams

These individuals have the unique capacity to generate widespread cohesive action that expands their domain of influence and leverage.¹⁵³ The critical interdependence of crisis situations allows extraordinary meta-leaders to emerge. Marked by strength of character and keen analytic skill, these unique leaders have the ability to lead, follow and productively engage others. These qualities forge an impact and level of collaboration not otherwise attained.¹⁵⁴ Many of these qualities were demonstrated by the quality of information collected from the experienced leaders that participated in the Delphi survey process. Although each participant brought a unique perspective to the research, the development of consensus is a reflection of the leadership perspectives and capabilities of the respondents.

E. SUGGESTIONS FOR FUTURE RESEARCH

Future research efforts have the opportunity to expand the inventory of potential command strategies and focus on integration of this knowledge into the training of commanders. Through these efforts, adaptive decision making, improved situational awareness, and collaborative capacity can be expanded and then harnessed as the foundation of problem solving during the response to emergent incidents. The literature reveals that four research gaps exist and the

¹⁵³ Leonard J. Marcus et al., *The Five Dimensions of Meta-Leadership* (Cambridge, MA: National Preparedness Leadership Initiative, Harvard School of Public Health,[2007]). 2.

¹⁵⁴ Ibid., 24.

opportunity to focus on transitional aspects of command remains vastly underexplored. The areas of opportunity are listed below:

1. Evaluation of interdisciplinary approaches to management of resources during chaotic events in an effort to develop multidiscipline best practices.
2. Identification of the social aspects that impact command decision making.
3. Research on the transition of incidents from complex to chaotic contexts.
4. Research concerning the potential for individuals to transition from experts to novices when facing chaotic and unimagined events.

Additional research opportunities also exist in evaluating the impact of social identity on emergency response and command decision making. Further research could explore barriers to implementation, and the development of interagency coordination strategies when groups do not have the opportunities to form a relationship prior to being immersed in an event. This thesis also unearthed the presence of significant stress placed on commanders during the response to asymmetric events. Although significant research exists on the topic of posttraumatic stress disorder, little research considers the unique aspects of the stress placed on Incident Commanders during these critical events.

F. CONCLUSION

Response to unfamiliar surge events is a complex process that requires the cooperation of stakeholders. Enhancing decision making during the initial response to surge events will require the collaboration of multiple agencies and an adaptive approach to decision making by ICs. Response operations are a complex adaptive system that requires creativity thinking, collaboration, improvisation, and leadership. This thesis examines the methodology of command decision making and provides ideas that can enhance the knowledge, skill and ability of ICs.

Facing unfamiliar surge events challenges even the most experienced commanders. These incidents place a unique level of responsibility and stress on the IC. In these critical situations, where high-risk decisions abound, identifying the signals that an incident is becoming emergent and providing an inventory of strategic options creates the tools necessary to enhance decision making. Communication of best practices remains a challenge, as this thesis demonstrates that even among seasoned experts a variety of exceptional ideas have been produced through the Delphi process. In absence of this process, many of these ideas would remain contained within a small group of respondents.

The recommendations of this thesis are focused on strategies that would enhance decision making during the first operational period of surge events. These ideas need to be considered through a stakeholder driven process. Recommendations include a series of strategically paced initiatives that encompass the following:

- Strengthen the training of ICs;
- Inform ICs of signals of chaotic incident transition;
- Provide an inventory of strategic options;
- Formalize incident support activities;
- Automate the response of support teams;
- Enhance nontraditional collaboration;
- Provide a stronger emphasis on the value of situational analysis;
- Provide education in nontraditional problem solving methods;
- Development of a quick action guide for ICs to utilize during the initial response to surge events.

Adoption of these ideas and innovations would challenge the status quo and provide a framework for consensus-based change. Specifically, implementation of the recommendations listed above has the potential to produce the following results:

- Documents the need for on-going command education;
- Enhances the knowledge base and decision-making framework of ICs;
- Provides a focus on the benefit of learning from the experience of other commanders;
- Informs ICS of the signals of chaotic incident transition;
- Provides a series of knowledge based resources built through the consensus of the Delphi panel;
- Enhances the level of incident support provided during the first operational period of surge events;
- Formalizes and automates support activities.

Through the information provided by this research process, the goal of this thesis has been reached. Decision making during the initial response to surge events will continue to challenge ICs with chaotic situations marked by time pressure, the need for immediate action and a great degree of uncertainty. As commanders engage the chaos prevalent in the heat of battle, the knowledge collected through this thesis can provide a foundation for leading more effective and efficient response efforts.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A. QUICK ACTON FIELD OPERATIONS GUIDE



NORTHAMPTON FIRE DEPARTMENT

UNFAMILIAR EVENT QUICK ACTION GUIDE

Signs of Chaotic Incident Transformation

Condition has been observed	Signs of Incident Transformation
	Safety compromise (loss of accountability, mayday, victim/firefighter injury)
	Lack of progress (situation escalates, unable to complete assignments)
	Strained command structure (lack of structure, unable to manage roles)
	Communications strain/breakdown (interoperability, radio system overload)
	Lack of sufficient information (situational analysis)
	High risk decisions (risk based analysis)
	Insufficient resources (loss of span of control)
	Lack of teamwork (freelancing)
	Overwhelmed (anxiety or confusion)
	Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, reporting volume not matching)
	Managed by the incident (reactive nature emerges)
	Command inundated with information (external concerns, requests for information)
	Multiple decision points/priorities (multiple operational sites/incidents)
	Loss of responder composure (paralysis, frustration, errors)
	Complex operations/structure (need to collaborate)
	Need to redeploy resources (defensive posture)
	Sense of urgency (intuition, voice modulation)
	Time expectations exceeded
Shading indicates signal rated as Urgent	
Shading indicates signal rated as extremely important	

Strategic Options to Consider

Ideas That have been utilized at this incident	Command Strategies to Consider
	Expand ICS structure, delegate responsibilities, empower personnel
	Utilize an aide
	Assign a scribe
	Assign a Liaison Officer
	Assign a Safety Officer
	Assign a Public Information officer (PIO)
	Assign a communications specialist (COMM L)
	Write down plans, complete checklists
	Develop a Unified Command Structure
	Utilize Command Staff or Additional Chief Officers from the Local Area
	Appoint a Deputy Incident Commander
	Appoint a Deputy Operations Officer
	Assign personnel to the Logistics Section
	Assign personnel to the Planning section
	Assign personnel to the Finance Section
	Request more resources than the initial assessment indicates
	Break the incident into manageable segments
	Constantly seek updated situational awareness
	Confer with experienced colleagues that are not on the incident scene
	Construct options (multiple game plans)
	Integrate nongovernmental personnel (e.g, local experts, private sector resources)
	Adjust the length of operational periods
	Automate notification of elapsed time through your dispatch center
	Implement security at the command post
	Move the command post away from the incident scene
	Conduct regular internal briefing sessions
	Limit radio traffic to critical communications
	Verify the credibility of information
	Assign a Public Information officer (PIO)
	Conduct press briefings away from the command post

Creative Ideas to Cope with Unfamiliar Surge Events

Ideas That have Been utilized at this incident		Creative Ideas to Cope with Unfamiliar Events
		Training in nontraditional problem solving methods
		Increased training and exercises
		Structured review of lessons learned from surge incidents
		Create support teams
		Assign an aide to command positions
		Computerized job aides
		Bottom up ICS focus
		Build expanded relationships
		Create mobile dispatch operations to reduce radio traffic

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B. CONFIRMATION EMAIL

Brian Duggan - Confirmation E-mail to Participants

To: Executive Fire Officer Graduates and Massachusetts Chief Fire Officers
From: Brian Duggan, Naval Postgraduate School Student
Date: May 7, 2012
Subject: Delphi Survey Participation and Coded Identification Number

Following up on our recent telephone conversation and as a reminder, I am in a Homeland Security Master's program at the Naval Postgraduate School in Monterey, California. I am writing to confirm your participation in a Delphi survey that I am conducting for my thesis. My purpose is to produce research that will assist incident commanders in the rapid identification of surge events that can exist within a chaotic context.

My research questions are:

1. As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate when routine events are transitioning to non-routine?
2. What strategies can be utilized to enhance decision-making during the initial response to chaotic surge incidents?

As an emergency incident develops, command structures are formulated to effectively and efficiently direct resources. During events that responders deal with on a regular basis, experience, patterns and cues are utilized to make strategic decisions that will produce appropriate response capability, thus minimizing the impacts of the event and the cost of response. Surge events are defined as emergency incidents that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism related events. These surge events are rare but can be of such a magnitude that the incident commander is confronted with a unique situation that is outside of his/her experience.

The research will consist of three rounds of surveys. Each will take about 30 minutes of your time. Each survey will be conducted using an online survey tool. Only I will have access to your raw data. Individual results will be aggregated and reported in a way that will allow your individual responses to remain confidential and anonymous. As a benefit to participation, my completed thesis will be available to you through the Homeland Security Digital Library in the hope that you will consider and share the results of the shared wisdom developed through this process.

I hope you remain willing to participate. If so, please record your coded identification number which is listed below; you will be asked to enter this number on the second page of each survey. The first page of each survey is required by the Naval Postgraduate School's review board for all research. It describes your protections in participating in the study. A link to the initial survey will be delivered to you in the next few days. I would appreciate it if you could respond as soon as possible once you receive the survey link.

Your randomly assigned identification number is: XXXX. You will be asked to enter this number at the beginning of the question portion of each survey.

If you have questions that I have not answered, please call or e-mail

Thank you in advance.

Brian Duggan
26 Carlton Drive
Northampton, MA 01060-2373
(413) 587-1039
bpduggan@nps.edu

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C. DELPHI SURVEYS ONE THROUGH THREE

Brian Duggan - Delphi Round One

Introductory E-mail

To: Delphi Survey Participants
From: "Brian Duggan, Naval Postgraduate Student"
Date: May 7, 2012

Subject: Round One Delphi Survey

This survey contains round one of my thesis research on enhancing decision-making during initial operations at surge events. Your perspectives are important. This is not a typical "statistical" survey. Your knowledge is critical to identifying signs of chaotic incidents and methodologies that can help us all on the incident scene.

My research questions are:

1. As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate when routine events are transitioning to non-routine?
2. What strategies can be utilized to enhance decision-making during the initial response to chaotic surge incidents?

This survey will take about 30 minutes of your time. Only I will have access to your raw data. Individual results will be aggregated and reported in a way that will allow your individual responses to remain confidential and anonymous.

I hope you are willing to participate. If so, please continue with the on-line survey below. The first page is required by the Naval Postgraduate School's review board for all research. It describes your protections in participating in the study. I would appreciate it if you could complete this survey within the next week. I will close it on May 22, 2012. Remember, you will need the randomly assigned identification number that was provided in the confirmation e-mail that I sent to you on May 8, 2012.

If you have questions that I have not answered, please call or e-mail.

Thank you in advance.

Brian Duggan
Naval Postgraduate Student
Northampton Fire Department
26 Carlton Drive
Northampton, MA 01060-2373

Office: (413) 587-1039
bpduggan@nps.edu

Brian Duggan - Delphi Round One

Informed Consent Form

Introduction: You are invited to participate in a research study entitled "Enhancing Decision-making during Initial Operations at Surge Incidents."

Procedures: The thesis questions are "As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate when routine events are transitioning to non-routine?" and "What strategies can be utilized to enhance decision-making during the initial response to chaotic surge incidents?"

Risks: The potential risks of participating in this study are no greater than those encountered in everyday life.

Benefits: Anticipated benefits from this study include improved decision-making during the first operational period of emergency response, as well as identifying which methodologies are the most effective when facing surge events. In addition, this research will assist incident commanders in the identification of surge events that exist within the chaotic context.

Compensation: No tangible compensation will be given. A copy of the completed thesis will be available through the Homeland Security Digital Library or through the author.

Confidentiality and Privacy Act: Any personal information that is obtained through this study will be kept confidential to the full extent permitted by law. Records will be maintained solely by the researcher at his office. No one else will have access to them. In the presentation of research findings, respondents will not be identified in any way so as to violate anonymity or confidentiality. However, it is possible that the researcher may be required to divulge information obtained in the course of this research to the subject chain of command or other legal body.

Voluntary nature of this study: Participation in this study is strictly voluntary, and if consent to participate is given; it can be withdrawn at anytime without prejudice.

Points of Contact: If there are any questions or comments regarding this project, or if a research related injury is received, the Researcher Brian Duggan should be contacted at (413) 587-1039, bduggan@nps.edu. Any other questions or concerns may be addressed to the Principal Investigator, Dr. Susan Hovevar at (831) 656-2249, shovevar@nps.edu or the Naval Postgraduate School IRB Chairman, Captain John Schmidt at (831) 656-3876, jkschmid@nps.edu.

Statement of Consent: I have read the information provided above. I have been given the opportunity to ask questions and all the questions that I have asked have been answered to my satisfaction. By continuing with the survey, I am agreeing to participate in this study. I understand that by agreeing to participate in this research, I do not waive any of my legal rights.

1. I agree to participate in this study. I understand that by agreeing to participate and clicking "yes" I do not waive any of my legal rights.

☐ Yes

☐ No

Brian Duggan - Delphi Round One

Survey Context

Please take a few moments and think about the following paragraph which is provided to give you some general information and context on the questions that will follow.

As an emergency incident develops, command structures are formulated to effectively and efficiently direct resources. During events that responders deal with on a regular basis, experience, patterns and cues are utilized to make strategic decisions that will produce appropriate response capability, thus minimizing the impacts of the event and the cost of response. Surge events are defined as emergency incidents that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism related events. These surge events are rare but can be of such a magnitude that the incident commander is confronted with a unique situation that is outside his/her experience.

Brian Duggan - Delphi Round One

Random Control Number

In my e-mail that confirmed your participation in this survey process you were assigned a randomly generated coding number. You will be asked to enter that number at the start of each of the three survey rounds. If you don't know what your number is please refer to the confirmation e-mail that I sent to you On May 6, 2012. In the event that you can't locate your number please contact me using the contact information below and I will provide that number for you:

Contact Information:

Brian Duggan
Naval Postgraduate Student
Northampton Fire Department
26 Carlton Drive
Northampton, MA 01060-2373

Office: (413) 587-1039
bpduggan@nps.edu

***2. Please enter your assigned coded control number in the box below:**

Assigned Coded Control
Number

Brian Duggan - Delphi Round One

Section I - General Information

3. How many years of fire service experience do you have

- ☐ Less than 15 years
- ☐ 15-19 years
- ☐ 20-24 years
- ☐ 25-29 years
- ☐ 30-34 years
- ☐ 35 or more years

4. How many years of experience as a command officer do you have?

- ☐ Less than 5 years
- ☐ 5-9 years
- ☐ 10-14 years
- ☐ 15-19 years
- ☐ 20-24 years
- ☐ 25 or more years

Section I - General Information

5. Working within the incident command system, what position do you most frequently fill?

Please select only one of the following choices

- ☐ Incident Commander
- ☐ Operations Section Chief
- ☐ Safety Officer
- ☐ Planning Section Chief
- ☐ Logistics Section Chief
- ☐ Other Command Position (please list in the box below)

Brian Duggan - Delphi Round One

Section II - Signs, Symptoms and Identification of Chaotic Incidents

6. What are the signals that a emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic?

Please list out the factors or signals that you have observed or experienced and provide as much information as possible.

7. ICS often uses benchmarks to determine incident progression or mitigation. As an incident unfolds, the situation can become chaotic, what benchmarks tell you that you have reached this point?

Please list these benchmarks and describe your observations.

Brian Duggan - Delphi Round One

Section II - Signs, Symptoms and Identification of Chaotic Incidents

8. Think about your experience responding to a routine single family residential structure fire. Imagine that the situation is showing signs of becoming non-routine (falling out of the ordinary). What are the signals that alert you to this transition.

Please provide a response in each of the three areas listed below:

Fireground Activity	<input type="text"/>
Incident Progression	<input type="text"/>
Personal Decision-making	<input type="text"/>
Other Signals	<input type="text"/>

9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation?

Please provide a response in each of the three areas listed below:

Emergency Scene Activity	<input type="text"/>
Incident Progression	<input type="text"/>
Personal Decision Making	<input type="text"/>
Other Signals	<input type="text"/>

Brian Duggan - Delphi Round One

Section II - Signs, Symptoms and Identification of Chaotic Incidents

10. Thinking about the situation that you utilized in question 9, were there any signals that you expected to see that were not present?

☐ Yes

☐ No

If Yes, what were the signals that were absent?

A rectangular text input field with a light gray background and a thin black border. It is currently empty.

11. If you answered Yes to Question 10, how did you interpret and react to the absence of these expected signals?

A rectangular text input field with a light gray background and a thin black border. It is currently empty.

Brian Duggan - Delphi Round One

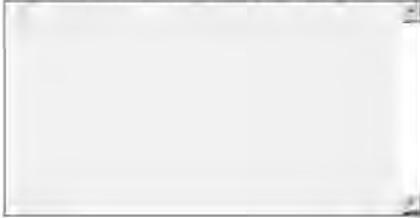
Section III - Decision-making Methodology

12. Do you utilize different decision-making strategies as an incident becomes unfamiliar and unpredictable?

☐ Yes

☐ No

If yes please explain; If no please indicate why your decision-making strategy remains constant.



Brian Duggan - Delphi Round One

Survey Closure

Thank you for completing the first round of the survey process. The second round will be developed based on the collective response to the first round and will be sent out in the next several weeks.

Brian Duggan

Brian Duggan - Delphi Round Two

Introductory E-mail

To: Delphi Survey Participants
From: Brian Duggan, Naval Postgraduate Student
Date: June 16, 2012

Subject: Round Two Delphi Survey

Thank you for responding to the round one survey, the collection of responses were both rich and thoughtful. Many of the questions in this survey build upon the foundation of your response to the round one survey.

This survey contains round two of my thesis research on enhancing decision-making during initial operations at surge events. Your perspectives are important. This is not a typical "statistical" survey. Your knowledge is critical to identifying signs of chaotic incidents and methodologies that can help us all on the incident scene.

The survey will take about 30 minutes of your time. Only I will have access to your raw data. Individual results will be aggregated and reported in a way that will allow your individual responses to remain confidential and anonymous.

I hope you are willing to participate. If so, please continue with the on-line survey below. The first page is required by the Naval Postgraduate School's review board for all research. It describes your protections in participating in the study. I would appreciate it if you could complete this survey within the next week. I will close it on June 28, 2012.

If you have questions that I have not answered, please call or e-mail.

Thank you in advance.

Brian Duggan
Naval Postgraduate Student
Northampton Fire Department
26 Carlon Drive
Northampton, MA 01060-2373

Cell: (413) 583-7610
bpduggan@nps.edu

Brian Duggan - Delphi Round Two

Informed Consent Form

Introduction: You are invited to participate in a research study entitled "Enhancing Decision-making during Initial Operations at Surge Incidents."

Procedures: The thesis questions are "As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate that a different method of decision-making is necessary?" and "What strategies can be utilized to enhance decision-making during the initial response to chaotic surge incidents?"

Risks: The potential risks of participating in this study are no greater than those encountered in everyday life.

Benefits: Anticipated benefits from this study include improved decision-making during the first operational period of emergency response, as well as identifying which methodologies are the most effective when facing surge events. In addition, this research will assist incident commanders in the identification of surge events that exist within the chaotic context.

Compensation: No tangible compensation will be given. A copy of the completed thesis will be available through the Homeland Security Digital Library or through the author.

Confidentiality and Privacy Act: Any personal information that is obtained through this study will be kept confidential to the full extent permitted by law. Records will be maintained solely by the researcher at his office. No one else will have access to them. In the presentation of research findings, respondents will not be identified in any way so as to violate anonymity or confidentiality. However, it is possible that the researcher may be required to divulge information obtained in the course of this research to the subject chain of command or other legal body.

Voluntary nature of this study: Participation in this study is strictly voluntary, and if consent to participate is given; it can be withdrawn at anytime without prejudice.

Points of Contact: If there are any questions or comments regarding this project, or if a research related injury is received, the Researcher Brian Duggan should be contacted at (413) 563-7610, bduggan@nps.edu. Any other questions or concerns may be addressed to the Principal Investigator, Dr. Susan Hovevar at (831) 656-2249, shovevar@nps.edu or the Naval Postgraduate School IRB Chairman, Captain John Schmidt at (831) 656-3876, jkschmid@nps.edu.

Statement of Consent: I have read the information provided above. I have been given the opportunity to ask questions and all the questions that I have asked have been answered to my satisfaction. By continuing with the survey, I am agreeing to participate in this study. I understand that by agreeing to participate in this research, I do not waive any of my legal rights.

1. I agree to participate in this study. I understand that by agreeing to participate and clicking "yes" I do not waive any of my legal rights.

☐ Yes

☐ No

Brian Duggan - Delphi Round Two

Survey Context

Please take a few moments and think about the following paragraph which is provided to give you some general information and context on the questions that will follow.

As an emergency incident develops, command structures are formulated to effectively and efficiently direct resources. During events that responders deal with on a regular basis, experience, patterns and cues are utilized to make strategic decision that will produce appropriate response capability, thus minimizing the impacts of the event and the cost of response. When formulating an operational plan during routine events, the majority of incident commanders function as experts and use perception, comprehension and projection to identify the potential ramifications of the unstable situation.

In the absence of familiar patterns and cues, experts employ analysis to recognize that something is wrong and transition toward defensive operations that emphasize operational sustainability and safety. Surge events are defined as emergency incidents that that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism related events. These surge events are rare and of such a magnitude that the incident commander is confronted with a unique situation that often exceeds his/her experience and ability to improvise and adapt to changing conditions.

The first survey that you completed (round one) produced 15 themes that a situation was becoming unpredictable, unfamiliar or chaotic. These signals as developed through round one will be a basis for a portion of this survey.

Brian Duggan - Delphi Round Two

Coded Control Number

In my e-mail that confirmed your participation in this survey process you were assigned a randomly generated coding number. You will be asked to enter that number at the start of each of the three survey rounds. If you don't know what your number is please refer to the confirmation e-mail that I sent to you On May 8, 2012. In the event that you can't locate your number please contact me using the contact information below and I will provide that number for you:

Contact Information:

Brian Duggan
Naval Postgraduate Student
Northampton Fire Department
26 Carlton Drive
Northampton, MA 01060-2373

Cell: (413) 563-7610
bpduggan@nps.edu

***2. Please enter your assigned coded control number in the box below:**

Assigned Coded Control
Number

Brian Duggan - Delphi Round Two

Section I - Surge Event Management

3. Surge events require more resources than are readily available. When encountering surge events such as a Mass Casualty Incident (MCI) what strategies do you employ to get ahead of the event?

4. During large events, what regional strategies have been developed in your area to compliment the initial response?

5. Often during chaotic events, the first few hours of response lack the required resource capability, how do you compensate?

Brian Duggan - Delphi Round Two

Section II - Information Management

6. During large, unfamiliar events the level of information directed toward the incident commander is often overwhelming. How do you manage and filter this information flow?

Brian Duggan - Delphi Round Two

Section III - Signals of the Unfamiliar

7. As a reminder during the first survey, you were asked to identify signals that an event is becoming unpredictable, unfamiliar or chaotic. Analysis of the responses to round one identified 18 themes by consolidating similar responses. As an example, responses including stress on the incident commander, anxiety, confusion, and dry mouth were consolidated into the theme of overwhelmed.

The following listing summarizes the response from the group of participants and identifies 18 themes which are listed from highest to lowest in terms of response frequency. Please rate each of the items below in terms of how important the signal would be to you in terms of indicating a situation is becoming unpredictable or chaotic.

	Not Important					Extremely Important
Lack of sufficient information (situational analysis)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overwhelmed (anxiety, confusion)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of Progress (Situation escalates, unable to complete assignments)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strained command structure (lack of structure, unable to manage roles)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communications strain/breakdown (interoperability, radio system overload)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety Compromise (loss of accountability, Mayday, Victim, Firefighter injury)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient resources (loss of span of control)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Command Inundated with information (external concerns, requests for information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, reporting volume not matching expectations, reports don't match observations, structural compromise)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Brian Duggan - Delphi Round Two

exceeded

Loss of responder composure (paralysis, frustration errors)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sense of urgency (intuition, voice modulation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Need to redeploy resources (defensive posture)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multiple decision points/priorities (multiple operational site/incidents)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managed by incident (reactive nature emerges, abandon SOPs or Preplans)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of teamwork (freelancing)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High risk decisions (risk based analysis)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Complex operations/structure (need to collaborate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. From the list above, please utilize your experience to pick the five signals that you feel are most important.

Signals and Benchmarks

Most important signal

Second most important signal

Third most important signal

Fourth most important signal

Fifth most important signal

Brian Duggan - Delphi Round Two

Section IV - Tools and Analysis

9. Given the previously identified signals that a situation is becoming unpredictable, unfamiliar or chaotic, what decision aids would enable improved confidence and capabilities in responding to that situation? Decision aids can include tools for information gathering, situational analysis, decision-making processes, etc. You can draw on best practice experience or think about the time(s) you have said "if only we had....." it would have helped us." These may be innovations that don't yet exist.

Please list your response below:

10. Is the National Incident Management System (NIMS ICS) an optimal model for making decisions during unpredictable and unfamiliar events?

☐ Yes

☐ No

Please explain why you selected your respective answer:

11. Have you improvised or adapted ICS to become more effective as you have faced the challenges of responding to unique incidents?

☐ Yes

☐ No

If you answered yes, please explain and provide examples. If you answered no please indicate why

Brian Duggan - Delphi Round Three

Introductory E-mail

To: Delphi Survey Participants
From: Brian Duggan, Naval Postgraduate Student
Date: July 22, 2012

Subject: Round Three Delphi Survey

First, I would like to thank you for participating in the first two rounds of this Delphi survey process. The quality of responses to date have exceeded my expectations. I appreciate the support that you have given me and brought to the validity of this process.

This survey contains the third and final round of my thesis research on enhancing decision-making during initial operations at surge events. Your perspectives are important. This is not a typical "statistical" survey. Your knowledge is critical to identifying signs of chaotic incidents and methodologies that can help us all on the incident scene.

The survey will take about 25 minutes of your time. Only I will have access to your raw data. Individual results will be aggregated and reported in a way that will allow your individual responses to remain confidential and anonymous.

I hope you are willing to participate. If so, please continue with the on-line survey below. The first page is required by the Naval Postgraduate School's review board for all research. It describes your protections in participating in the study. I would appreciate it if you could complete this survey within the next week. I will close it on August 5, 2012.

If you have questions that I have not answered, please call or e-mail.

Thank you in advance.

Brian Duggan
Naval Postgraduate Student
Northampton Fire Department
26 Carlton Drive
Northampton, MA 01060-2373
Cell: (413) 583-7610
bpduggan@nps.edu

Brian Duggan - Delphi Round Three

Informed Consent Form

Introduction: You are invited to participate in a research study entitled "Enhancing Decision-making during Initial Operations at Surge Incidents."

Procedures: The thesis questions are "As emergency incidents expand toward the chaotic context, what symptoms, patterns and cues exist to indicate that a different method of decision-making is necessary?" and "What strategies can be utilized to enhance decision-making during the initial response to chaotic surge incidents?"

Risks: The potential risks of participating in this study are no greater than those encountered in everyday life.

Benefits: Anticipated benefits from this study include improved decision-making during the first operational period of emergency response, as well as identifying which methodologies are the most effective when facing surge events. In addition, this research will assist incident commanders in the identification of surge events that exist within the chaotic context.

Compensation: No tangible compensation will be given. A copy of the completed thesis will be available through the Homeland Security Digital Library or through the author.

Confidentiality and Privacy Act: Any personal information that is obtained through this study will be kept confidential to the full extent permitted by law. Records will be maintained solely by the researcher at his office. No one else will have access to them. In the presentation of research findings, respondents will not be identified in any way so as to violate anonymity or confidentiality. However, it is possible that the researcher may be required to divulge information obtained in the course of this research to the subject chain of command or other legal body.

Voluntary nature of this study: Participation in this study is strictly voluntary, and if consent to participate is given; it can be withdrawn at anytime without prejudice.

Points of Contact: If there are any questions or comments regarding this project, or if a research related injury is received, the Researcher Brian Duggan should be contacted at (413) 587-1039, bduggan@nps.edu. Any other questions or concerns may be addressed to the Principal Investigator, Dr. Susan Hovevar at (831) 656-2249, shovevar@nps.edu or the Naval Postgraduate School IRB Chairman, Captain John Schmidt at (831) 656-3876, jkschmid@nps.edu.

Statement of Consent: I have read the information provided above. I have been given the opportunity to ask questions and all the questions that I have asked have been answered to my satisfaction. By continuing with the survey, I am agreeing to participate in this study. I understand that by agreeing to participate in this research, I do not waive any of my legal rights.

1. I agree to participate in this study. I understand that by agreeing to participate and clicking "yes" I do not waive any of my legal rights.

☐ Yes

☐ No

Brian Duggan - Delphi Round Three

Survey Context

Please take a few moments and think about the following paragraph which is provided to give you some general information and context on the questions that will follow.

As an emergency incident develops, command structures are formulated to effectively and efficiently direct resources. During events that responders deal with on a regular basis, experience, patterns and cues are utilized to make strategic decision that will produce appropriate response capability, thus minimizing the impacts of the event and the cost of response. When formulating an operational plan during routine events, the majority of incident commanders function as experts and use perception, comprehension and projection to identify the potential ramifications of the unstable situation. In the absence of familiar patterns and cues, experts employ analysis to recognize that something is wrong and transition toward defensive operations that emphasize operational sustainability and safety. Surge events are defined as emergency incidents that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism related events. These surge events are rare and of such a magnitude that the incident commander is confronted with a unique situation that often exceeds his/her experience and ability to improvise and adapt to changing conditions.

Brian Duggan - Delphi Round Three

Coded Control Number

In my e-mail that confirmed your participation in this survey process you were assigned a randomly generated coding number. You will be asked to enter that number at the start of each of the three survey rounds. If you don't know what your number is please refer to the confirmation e-mail that I sent to you On May 8, 2012. In the event that you can't locate your number please contact me using the contact information below and I will provide that number for you:

Contact Information:

Brian Duggan
Naval Postgraduate Student
Northampton Fire Department
26 Carlton Drive
Northampton, MA 01060-2373

Office: (413) 563-7510
bpduggan@nps.edu

***2. Please enter your assigned coded control number in the box below:**

Assigned Coded Control
Number

Brian Duggan - Delphi Round Three

Section I - Command Strategies

3. The second round survey asked you to identify strategies to get ahead of a surge event. The most frequent response to this question was to employ preplanning and rapidly activate mutual aid plans. To provide you with some additional context, I have listed two examples of responses that focused on this issue.

“The key strategy is preplanning and having a plan in place for the event that occurs so infrequently. We often refer to it as the 3rd level of resources and having a plan in place and making sure that it is activated in a timely manner is critical to the eventual outcome of the incident.”

“Preplanning for surge events allows you to access additional resources in a coordinated and organized manner – this allows you to focus on the situation at hand.”

Reflecting on the information above, what could make the existing 2nd (regional) and 3rd (state) tier mutual aid plans more effective?

Brian Duggan - Delphi Round Three

Section I - Command Strategies

4. Please rate the frequency that you have utilized the strategies listed below:

If you answer never you can also check the box on the far right if you would consider adopting this approach in the future.

	Never	Seldom	Sometimes	At All Significant Incidents	If you answered never, check this box if you would consider adopting this approach in the future
Assign a Liaison Officer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assign a Safety Officer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop a Unified Command Structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utilize Command Staff or additional Chief Officers from the local area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appoint a Deputy Incident Commander	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appoint a Deputy Operations Officer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assign personnel to the Logistics Section	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assign personnel to the Planning Section	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assign personnel to the Finance Section	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Request more resources than the initial assessment indicates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Break the incident into manageable segments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constantly seek updated situational awareness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confer with experienced colleagues that are not on the incident scene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Construct options (multiple game plans)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integrate non-governmental personnel (e.g local experts, private sector resources)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adjust the length of operational periods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Automate notification of	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Brian Duggan - Delphi Round Three

elapsed time through your
dispatch center

Brian Duggan - Delphi Round Three

Section I - Command Strategies

5. Other than the use of mutual aid plans, the second round Delphi survey suggested that one of the next most important capabilities is the informal response of area Chief Officers. The following quotes are taken from round two survey responses.

"The automatic response of area Chief Officers provide assistance with scene management, safety, and the control of resources from multiple jurisdictions."

"Mutual aid relationships include the response of Chief Officers to assist with incident management functions. This can be informal, with chiefs responding with their companies as part of the mutual aid response."

How could the value of the informal response of area Chief Officers detailed above be strengthened?

Brian Duggan - Delphi Round Three

Section II - Operational Concepts

6. Please indicate how frequently you utilize each of the following methodologies to assist you in the management of surge incidents.

If you answer never you can also check the box on the far right if you would consider adopting this approach in the future.

	Never	Seldom	Sometimes	At All Significant Incidents	If you answered never check this box if you would you consider adopting this approach in the future.
Expand ICS Structure, delegate responsibilities, empower personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utilize an aide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assign a liaison	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assign a scribe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assign a communications specialist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Write down plans, complete checklists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Break the incident into manageable segments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encourage the relationship based response of local chief officers – informal support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implement security at the command post	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Move the command post away from the incident scene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conduct regular internal briefing sessions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Limit radio traffic to critical communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify the credibility of information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assign a Public Information Officer (PIO)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conduct press briefings away from the command post	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Brian Duggan - Delphi Round Three

Section III - Command Innovation

7. Round two generated many good ideas on decision aides and I would like your feedback on some of these concepts.

If you were recommending investment in each of these decision aids listed below, what priority would you give each of the eight concepts listed below?

Please select no more than three items for each category.

	Low Priority	Middle Priority	Top Priority
Video based aerial reconnaissance (drone, helicopter)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhanced accountability systems that indicate personnel position and elevation using sensors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Automatic Incident Management Team (IMT) response	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training programs and exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Video conferencing capability with experienced personnel or subject matter experts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sensor based interior monitoring of temperature, thermal imagery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computerized checklists and preplan data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet access on the incident scene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Please list any other ideas that you have for decision aids that are useful during the response to surge events.

Brian Duggan - Delphi Round Three

Section III - Command Innovation

9. During the second round Delphi survey, approximately 45% of respondents indicated that the National Incident Management System (NIMS) is not an optimal model for making decisions during unpredictable and unfamiliar events. A review of the German Regulation DV 100 (the German equivalent to NIMS) identified several potential concepts. Would you support modifying NIMS with these practices?

	Yes	No
Develop partnerships with non traditional organizations such as private corporations or clubs	<input type="radio"/>	<input type="radio"/>
Develop a communications and transmission staff function	<input type="radio"/>	<input type="radio"/>
Develop a personnel and administration staff function	<input type="radio"/>	<input type="radio"/>
Develop an information gathering and assessment staff function	<input type="radio"/>	<input type="radio"/>
Develop computer based command checklists	<input type="radio"/>	<input type="radio"/>
Move the command post to a fixed off site facility	<input type="radio"/>	<input type="radio"/>
Provide less structure and allow more creativity	<input type="radio"/>	<input type="radio"/>
Automated response of incident support teams	<input type="radio"/>	<input type="radio"/>
Development of situational analysis teams (dedicated personnel that focus on gathering and verifying information for the incident commander)	<input type="radio"/>	<input type="radio"/>
Development of regional support teams	<input type="radio"/>	<input type="radio"/>

Section III - Command Innovation

10. As a reminder, surge events are defined as emergency incidents that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism related events. These surge events are rare and of such a magnitude that the incident commander is confronted with a unique situation that often exceeds his/her experience and ability to improvise and adapt to changing conditions.

What creative or innovative ideas do you have to enhance the ability to cope with these unfamiliar situations?

Brían Duggan - Delphi Round Three

Survey Closure

Thank you for completing this survey process. My completed thesis will be available through the Homeland Security Digital Library once it has been reviewed and approved.

Brían Duggan

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX D. DELPHI SURVEY DATA

Note: Page numbers on the Survey Monkey data have random blank inserts, which separate data for the purpose of analysis.

Brian Duggan - Delphi Round One



1. I agree to participate in this study. I understand that by agreeing to participate and clicking "yes" I do not waive any of my legal rights.

		Response Percent	Response Count
Yes		100.0%	30
No		0.0%	0
answered question			30
skipped question			0

2. Please enter your assigned coded control number in the box below:

	Response Average	Response Total	Response Count
Assigned Coded Control Number	4,829.00	144,870	30
answered question			30
skipped question			0





3. How many years of fire service experience do you have

	Response Percent	Response Count
Less than 15 years	0.0%	0
15-19 years	3.3%	1
20-24 years	16.7%	5
25-29 years	16.7%	5
30-34 years	36.7%	11
35 or more years	26.7%	8
answered question		30
skipped question		0

4. How many years of experience as a command officer do you have?

	Response Percent	Response Count
Less than 5 years	3.3%	1
5-9 years	10.0%	3
10-14 years	30.0%	9
15-19 years	26.7%	8
20-24 years	13.3%	4
25 or more years	16.7%	5
answered question		30
skipped question		0

**5. Working within the incident command system, what position do you most frequently fill?
Please select only one of the following choices**

		Response Percent	Response Count
Incident Commander		90.0%	27
Operations Section Chief		3.3%	1
Safety Officer		3.3%	1
Planning Section Chief		0.0%	0
Logistics Section Chief		0.0%	0
Other Command Position (please list in the box below)		3.3%	1
answered question			30
skipped question			0





6. What are the signals that a emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic? Please list out the factors or signals that you have observed or experienced and provide as much information as possible.

	Response Count
	30
answered question	30
skipped question	0





7. ICS often uses benchmarks to determine incident progression or mitigation. As an incident unfolds, the situation can become chaotic, what benchmarks tell you that you have reached this point? Please list these benchmarks and describe your observations.

	Response Count
	29
answered question	29
skipped question	1


8. Think about your experience responding to a routine single family residential structure fire. Imagine that the situation is showing signs of becoming non-routine (falling out of the ordinary). What are the signals that alert you to this transition. Please provide a response in each of the three areas listed below:

		Response Percent	Response Count
Fireground Activity		100.0%	28
Incident Progression		100.0%	28
Personal Decision-making		100.0%	28
Other Signals		67.9%	19
	answered question		28
	skipped question		2

9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation? Please provide a response in each of the three areas listed below:

		Response Percent	Response Count
Emergency Scene Activity		96.4%	27
Incident Progression		96.4%	27
Personal Decision Making		96.4%	27
Other Signals		64.3%	18
answered question			28
skipped question			2



10. Thinking about the situation that you utilized in question 9, were there any signals that you expected to see that were not present?

		Response Percent	Response Count
Yes		46.4%	13
No		53.6%	15
If Yes, what were the signals that were absent?			15
answered question			28
skipped question			2

11. If you answered Yes to Question 10, how did you interpret and react to the absence of these expected signals?

	Response Count
	13
answered question	13
skipped question	17

12. Do you utilize different decision-making strategies as an incident becomes unfamiliar and unpredictable?

	Response Percent	Response Count
Yes 	72.4%	21
No 	27.6%	8
If yes please explain, If no please indicate why your decision-making strategy remains constant.		25
answered question		29
skipped question		1

Page 4, Q2. Please enter your assigned coded control number in the box below:

1	5600	May 21, 2012 10:18 AM
2	4950	May 20, 2012 7:38 PM
3	4600	May 17, 2012 8:59 AM
4	4650	May 15, 2012 8:10 PM
5	5200	May 15, 2012 12:42 PM
6	4800	May 15, 2012 7:18 AM
7	4350	May 14, 2012 1:52 PM
8	4250	May 14, 2012 1:15 PM
9	5400	May 14, 2012 11:44 AM
10	5050	May 14, 2012 9:41 AM
11	5100	May 14, 2012 7:40 AM
12	4400	May 14, 2012 6:34 AM
13	5350	May 14, 2012 6:23 AM
14	5250	May 14, 2012 6:11 AM
15	5500	May 14, 2012 5:06 AM
16	4300	May 14, 2012 4:54 AM
17	4900	May 11, 2012 7:17 AM
18	4200	May 10, 2012 8:46 AM
19	4750	May 10, 2012 3:33 AM
20	5300	May 9, 2012 12:06 PM
21	4770	May 9, 2012 10:43 AM
22	4500	May 9, 2012 4:38 AM
23	5150	May 9, 2012 4:11 AM
24	4850	May 8, 2012 6:14 PM
25	4150	May 8, 2012 11:07 AM
26	4550	May 8, 2012 9:09 AM
27	5000	May 8, 2012 8:44 AM

Page 4, Q2. Please enter your assigned coded control number in the box below:

28	5450	May 8, 2012 7:21 AM
29	4100	May 8, 2012 5:54 AM
30	4450	May 8, 2012 5:06 AM

Page 6, Q5. Working within the incident command system, what position do you most frequently fill? Please select only one of the following choices

1	Branch manager or agency representative	May 8, 2012 6:16 PM
---	---	---------------------

Page 7, Q6. What are the signals that a emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic?

Please list out the factors or signals that you have observed or experienced and provide as much information as possible.

1	I.C. unable to manage all the functions and begin to expand and delegate roles. The signals are that the demands upon the I.C. or designated staff are becoming overwhelmed.	May 21, 2012 10:54 AM
2	1. Lack of situational awareness. 2.	May 20, 2012 7:43 PM
3	reports from company officers that they are unable to accomplish their tasks due to unexpected conditions (heavy fire, collapse, explosion, blocked by cars/apparatus) reports from company officers that clearly indicate failure to follow SOG's. This can be no SCBA, improper position or location within a structure. conflicting reports. reports do not match visible conditions from the exterior. (OIC says they have a knock but I still see fire)	May 17, 2012 9:10 AM
4	Errors by the IC or the recipient of instructions or requests made of the assigned crew (s). A fast evolving incident where either the IC or involved CO is unable to see obvious and apparent evolving conditions. Or, situations where adverse conditions are acutely present and either or both the IC and crews do not react appropriately to an impending hazardous condition.	May 15, 2012 8:20 PM
5	Increased number of reports from civilian or other public safety sources, personal observations that do not match expectations based on experience, verbal cues from others, lack of data or information, observations that do not coincide with data or information, lack of progress/effectiveness from/of actions underway or already taken.	May 15, 2012 12:54 PM
6	Resource Depletion Insufficient Staffing Unfamiliar or Unusual Occurrences at the incident. A building or facility acting in a manner that I have not experienced or have not been trained in. Frustration of responders to effectively control the situation, the scene is uncontrollable due to the location and the ability to define the scene's physical parameters.	May 15, 2012 7:27 AM
7	1. Initial resources overwhelmed. 2. Accurate assessment information difficult to obtain. 3. Communications become strained as evidenced by increased anxiety or difficulty in managing emergency situation. 4. Expected time to resolve emergency situation is passed. 5. SOP's are not being followed. 6. Command Structure becoming less effective or strained. 7. Safety compromise or inability to secure or stabilize scene.	May 14, 2012 4:01 PM
8	- Based on an assessment of the situation being faced, a determination that the number of resources at the scene, or already en route will not be sufficient to manage the situation. - Due to the complexity of the incident, unable to get real-time updates of actual conditions being faced by responders. - Responders start to panic or make mistakes while executing basic and routine functions. - That pit in the stomach ("gut feeling") that the incident is starting to manage the IC, and not the other way around.	May 14, 2012 1:23 PM
9	1. Lack of personnel to fill out assignments. 2. Unable to fill command roles within ICS. 3. Situation does not improve and safety is compromised.	May 14, 2012 12:14 PM

Page 7, Q6. What are the signals that a emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic?

Please list out the factors or signals that you have observed or experienced and provide as much information as possible.

- | | | |
|----|--|-----------------------|
| 10 | * Rapidly worsening condition * Inadequate command staff available to handle necessary ICS positions | May 14, 2012 12:00 PM |
| 11 | Some signals would be that you are experiencing something that you have not seen before or those assisting you have not seen, that is the first signal. Additional signals would be that your normal thought process and actions contemplated do not cover the incident that you are facing. In addition, other factors and concerns that you normally do not deal with need to be addressed and that your acting in a timely manner is critical to both the short term success and long term success. | May 14, 2012 7:49 AM |
| 12 | The incident is overwhelming to initial first responders upon their arrival. The incident is escalating much more rapidly than the initial responders can take control/mitigation action(s). As the initial (or even a later arriving/higher rank/senior) command officer I am finding it difficult to get a good handle on the magnitude/extent of the incident. If you don't know exactly what the incident entails, you can't develop an effective plan of action to attempt to control/mitigate it. As the IC numerous reports are being sent back to you that continue to paint a picture of an incident/situation whose magnitude/scope continues to grow. Frequent reports that resources that have been assigned/deployed are unable to complete their assigned missions/tasks. A realization (intangible gut feeling) that I have never seen this before and that the incident has/is moving out of my personal sphere of experience. | May 14, 2012 6:54 AM |
| 13 | Available onscene resources are overwhelmed and/or inadequate. Unable to get a "Complete picture" of the problem - i.e. lack of information as to what exactly has happened/is happening. No clear picture as to how much worse the incident will get. | May 14, 2012 6:34 AM |
| 14 | The initial IC has requested an unusual amount of mutual aid for the incident based on the initial size up. When the IC or other personnel on the scene sound very excited or anxious on the radio. When the IC is getting inundated with a lot of information from other units on scene or from dispatch or police units. When units on scene have lost their ability to remain calm and within the command structure, there are times when multiple units begin to give radio messages and direction outside of their role. | May 14, 2012 6:22 AM |
| 15 | In my experience at a Command Level position within my department we have dealt with MANY "unpredictable, unfamiliar or chaotic" events. Most of these have been weather related including; mudslide, micro bursts, blizzard, and hurricanes. In each of these events, the indicators varied. For the blizzards and hurricanes-accurate weather modeling and forecasting allowed for emergency preparations that included additional staffing, development of an IAP, planning meetings with other public safety and public utility organizations and then the "wait and see" approach to the arrival of the weather. This worked well for planning and preparation but the thresholds for becoming "chaotic" were clearly identifiable when the request for service exceeded the capabilities of the planning and available resources. During our mudslide event which occurred after a period of very heavy sustained rain-there were no indicators of the potential for | May 14, 2012 5:26 AM |

Page 7, Q6. What are the signals that a emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic?

Please list out the factors or signals that you have observed or experienced and provide as much information as possible.

a mudslide. First 911 call was for car trapped in rising waters. After extricating the driver from the vehicle the first arriving Command Officer investigated the cause of the rising water and found the mudslide threatening an entire neighborhood and residents who were still asleep in their homes unaware of the threat. During Hurricane Irene-my community was heavily impacted by the flash flooding effect of rising waters from heavy rain across the entire region. Being located at the confluence of three major rivers all originating north of my community-the back up of waters caused significant flooding and damage to many neighborhoods and public infrastructure. This "flash flooding" was predicted by the NWS and once it started-the speed and intensity overwhelmed even the best Planning and modeling. Again-a situation where the request or need for resources rapidly overtook the available resources.

- | | | |
|----|---|----------------------|
| 16 | Unusual from the start. Situations where initial commander has problems getting ICS established or under incident under some sort of control or lack of ICS at all prior to my arrival. The lack of the IC reading the signs of the fire or other incident and failing to think forward not visualizing potential incident needs ahead of time. Inexperienced IC being blindered into the incident and not taking their surroundings into account. | May 14, 2012 5:05 AM |
| 17 | Voice modulation increases Cannot assign resources quick enough Responders are panicked Lose accountability of scene ICS system is not expanded enough to maintain control | May 11, 2012 7:22 AM |
| 18 | Injury or death to one or more first responders during response or operation phase, which requires taking resources away from other tasks; Unexpected need to shift from interior fire ops to exterior (defensive) mode; Two or more simultaneous major incidents; Multiple exposure fires, particularly those caused by firebrands on buildings away from the primary fire scene | May 10, 2012 9:00 AM |
| 19 | *A noticeable sense of urgency in the dispatchers voice and first on scene first responders (typically police officers). *A noticeable sense of urgency in the voice of the initial fire IC on scene who can be a junior officer, senior firefighter in a acting position, or inexperienced command officer. *Long periods of silence on the radio after initial arrival on scene by emergency responders who may be trying to grasp the size of the incident before giving a report. | May 10, 2012 4:07 AM |
| 20 | Fire is extending to interior/exterior exposures. The IC is getting innacurate updates from his sector chiefs. Time being essential. How long has this fire been burning? You begin to loose your ability to maintain accurate firefighter accountability. | May 9, 2012 12:06 PM |
| 21 | Catastrophic event occurs FFs overly excited on fireground Command staff gets vacant stare in eyes Your heart tries to jump out of your body and that whooshing feeling surges through your body up into your brain. A FF injury (or worse) on the scene disrupts the functionality and composure of FFs. | May 9, 2012 10:52 AM |
| 22 | Not having resources to respond to multiple calls related to one event. Having to triage incoming requests for service (not normal, usually have enough resources | May 9, 2012 4:44 AM |

Page 7, Q6. What are the signals that a emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic?

Please list out the factors or signals that you have observed or experienced and provide as much information as possible.

- to get a response to incident may not be a full response but something gets dispatched) Observing potential unidentified incident locations while responding to or working at an incident. Regular Mutual Aid unavailable. Never seeming to catch up and get ahead of the incident.
- | | | |
|----|--|----------------------|
| 23 | The time frame it takes to reach your initial goal of correcting the direction of the situation. Resources you are given to operate in a safe and prudent manner. Having the right tools and education to carry out the task at hand. Establishing the incident Command System on initial response. Insufficient people to manage and reach your goal. Beyond your resources at hand and not having the knowledge to continue in a safe prudent manner, like in a hazmat situation, not realizing that you need a Hazmat tech or not realizing to call for the regional team to help mitigate the situation. Not requesting sufficient help from the initial deployment and not recognizing early in the game that you need assistance to complete the task. Not having a plan that changes with the situations given. | May 9, 2012 4:36 AM |
| 24 | Abandoning pre-plans. Commanders will allow operations for which plans exist, allowing subordinate positions or sectors to operate independently; Commanders will abandon efforts to coordinate overall operations and ignore the development of separate operations that are not in sync, "analysis paralysis"; Commanders will delay making decisions awaiting more and more information. | May 8, 2012 6:26 PM |
| 25 | A natural disaster event most frequently comes to mind. I continuously monitor weather conditions during seasonal times when there can be nasty storms running through our area. The sudden tornado or wind shear can quickly overwhelm forces. Experience has taught me when a severe weather system is approaching to avoid sending a normal response assignment to a scene. It's important to monitor neighboring FD's to hear if they're experiencing storm related calls. If they're tied up chasing storm calls they will be unavailable for mutual aid. As was the case a few years ago we experienced a severe outbreak of thunder storms covering a wide area of the town I was in at the time. The coverage area of this town is 25 square miles of mostly residential homes with lots of trees to contend with. The FD operated out of two fire houses with a engine, tanker and light-duty rescue in each house. In anticipating the level of potential damage I held all assignments to one response vehicle. That gave me six vehicle plus a spare engine and myself as response vehicles. As 911 calls started to come in it was quick to realize a normal two engine response was not in anyone's best interest. One of the more heavily populated areas was hit extremely by a wind shear. Reports were coming in of multiple structures with multiple trees into them. It was chaos that needed order. Rather than to commit myself to the mix of responding apparatus, I staged myself as mobil command post. I had dispatch route all calls through the CP. Units were advised to hold off on any self-dispatching. Like EMS calls were quickly given a priority and a single company was dispatched. Life safety issues were given a high priority, followed by fire, gas leaks, and trees into houses. It took a bit of work to get things organized because initially dispatch was tuning out anything they were receiving. This was frustrating to them due partially to their inability to keep responding units in order as well as try and answer phones. Once two more | May 8, 2012 11:36 AM |

Page 7, Q6. What are the signals that a emergency situation is moving beyond the expected and becoming unpredictable, unfamiliar or chaotic?

Please list out the factors or signals that you have observed or experienced and provide as much information as possible.

	dispatchers were in place we were able to organize things.	
26	Multiple decisions become necessary to make. Operational Staff try to talk directly to IC. Need to bring in units with specific training. Need to fill out the ICS positions	May 8, 2012 9:33 AM
27	Situation not becoming stabilized Situation begins to dictate the response/actions Needed resources not immediately available	May 8, 2012 8:49 AM
28	1. Initial call and perception of 911 caller that the emergency requires additional resources. 2. Repeat calls to 911. 3. Urgency on police requests to FD to "step on it". 4. Initial size up, type of building, smoke color texture and velocity. 5. Warning of regional emergency planning members suggesting a large storm event. 6. Demographic, nursing homes, schools etc. Events tend to escalate	May 8, 2012 7:27 AM
29	Late information i.e. dispatch had the information but never told command. Police arrive with the information which can create confusion and chaos. Lack of resources – without proper resources you may not find out you have a problem until new resources assess as they arrive.	May 8, 2012 6:04 AM
30	To begin with, I suggest we avoid treating any call as "routine". Expect the unexpected, preparation, preparation, preparation. On a fire scene signals can include conflicting reports from officers on interior conditions, exterior conditions that do not coincide with interior reports, and a scene that is escalating after we have been on scene and working for ten minutes. The tone and pitch of my officers as they are giving me reports can also be an indicator that they too are seeing something outside the norm. Traditional tactics that are not having the desired effect on the fire, or the usual affect, can be a tip off to an unusual event. A sudden unexpected event, such as a roof collapse, that immediately changes the entire scene. When speaking of events other than a fire I have witnessed the following clues that tell me things are going south. Increased anxiety on the part of other non-fire agency members can be obvious. (I find that members outside the public safety domain get flustered with change and are less able to think on their feet, for the most part.) Another serious clue is when a situation arises for which there is no "responsible" governmental agency available. i.e. Calls come in for a helicopter, yet no one in the command has that ability. Another clear sign is when the Incident Command system begins to fall apart due to the participants. When situations begin to increase in size and complexity, these are exactly the times when IC is paramount. Yet time and again I have seen IC thrown out the window because things got "hot". When there are multiple tasks involving different organizations we MUST work under one Incident Commander. As Incident Commanders we rely on our training, knowledge and experience. An Incident Commander worth his salt WANTS to be in command, and feels he is the best person to run the scene. In that position, when an issue arises that he is totally unfamiliar with, and realizing he has the most experience on scene, that can be unnerving and a serious sign.	May 8, 2012 5:36 AM

Page 7, Q7. ICS often uses benchmarks to determine incident progression or mitigation. As an incident unfolds, the situation can become chaotic, what benchmarks tell you that you have reached this point?

Please list these benchmarks and describe your observations.

1	Incident overwhelming local resources. Staff not following the SOP's for the type of incident. Incident continues to expand and staff stress levels are rising.	May 21, 2012 10:54 AM
2	lack of accountability reports that are not clear. This can be physically (garbled) or cognitively (I do not understand what the OIC is reporting and do not have a picture of his conditions, actions and needs) inadequate number of resources: when the on-scene resources are overwhelmed by victims or conditions, an incident can become chaotic	May 17, 2012 9:10 AM
3	Arrival Report based on (CAN) Request for add'l Units Water on the fire Entry made into structure Maintaining of PAR levels Heavy fire conditions despite aggressive ongoing offensive operations Forward progress of fire Decrease in fire progression Ventilation Primary and secondary searches completion Establishment of Rehab Rotation of Crews Fire under control Fire out	May 15, 2012 8:20 PM
4	Incident action plan goals that are not achieved in the given operational period but were considered doable during the planning stage would be one benchmark. Resource availability through internal or external sourcing, in staging or in use that does not meet the need is another benchmark that might indicate a chaotic situation. Inability to staff and maintain the necessary complement in ICS positions can also be an indicator of how stable the incident is.	May 15, 2012 12:54 PM
5	Scene safety is compromised You have more tasks that need to be done than you have resources to accomplish them. Whenever you have not completed an initial search or survey of the incident and there are reports of additional or unknown life safety issues. The IC has insufficient command staff to assist in the decision making process.	May 15, 2012 7:27 AM
6	1. Inability to gain control of situation. 2. Situation deteriorates rapidly. 3. Problems with command structure in meeting objectives. 4. Difficulty in determining resources required and problems with accountability of resources already committed. 5. Conflict between competing interests. 6. Incompatibility of radio communications.	May 14, 2012 4:01 PM
7	- Communication breaks down with functional units, and updates are not answering the questions the IC is posing. - The resource needs surpass the available resources. - Scene management seems to be slipping away.	May 14, 2012 1:23 PM
8	All the same factors as above, especially when no progress is being made and safety is compromised.	May 14, 2012 12:14 PM
9	* Loss of span of control * Inadequate resources available on scene to handle the necessary tasks	May 14, 2012 12:00 PM
10	I would say that almost every incident borders on chaotic, it is managing that chaos that is key. What is concerning is when the "normal" chaos becomes something other than that, some of those benchmarks would be: Exhausted all local and regional resources. Additional assistance will need to come from further away and will be operating completely out of their "normal" area and that may create some operational issues. Resources that are normally used or	May 14, 2012 7:49 AM

Page 7, Q7. ICS often uses benchmarks to determine incident progression or mitigation. As an incident unfolds, the situation can become chaotic, what benchmarks tell you that you have reached this point?

Please list these benchmarks and describe your observations.

accessed on a day to day basis are usually easily obtained. What is more difficult is the benchmark that we have exceeded these resources and now must try to access additional, specialized resources that we may not be that familiar with. Something along the lines of water shuttle resulting from a major break could create logistical problems for departments that do not normally use that type of resource.

- | | | |
|----|---|----------------------|
| 11 | An inability for various assigned/deployed resources to complete their assignments/missions within normal accepted time frames. No discernable progress on incident control/mitigation within several short, normally reasonable operational progress periods, i.e: 15 minutes, 30 minutes, 60 minutes, etc. An ongoing need to quickly deploy resources that you do not have available to critical incident tasks/assignments. A belief that you will be playing "catch up" for an extended period of time and conversely an inability to "get ahead" of the incident. | May 14, 2012 6:54 AM |
| 12 | No available resources for assignment - having to wait for additional resources to arrive before accomplishing needed tasks. No progress being made towards mitigation goals - "losing the battle." Breakdown of effective communications - can't get useful reports, breakdown of radio protocols (personnel yelling into radios or in person). | May 14, 2012 6:34 AM |
| 13 | When the fire is not behaving as predicted and it goes beyond the current resources ability to handle very quickly. When personnel loose their control to remain with-in the command structure, such as radio traffic becoming uncontrollable, units self deploying, or IC losing contact with a unit(s). There is also times when a lot of mutual aid is called and the command structure has not been set up to handle it, this is indicated when the IC becomes barrage by mutual aid officers making suggestions on the operation. | May 14, 2012 6:22 AM |
| 14 | The most common benchmark for reaching the "chaotic" point in an event from my experience is when the request or need for resources exceeds the available resources. Decisions have to be made at the Command Level and the tactical level as to what missions we can and will respond to and which missions we cannot. My observations of this include the 911 center advising that requests for services are being stacked up and triaged, and or loss of utilities to key infrastructure, and declarations of a "local emergency" | May 14, 2012 5:26 AM |
| 15 | Usually during an incident the IC has short and long term goals. However in the heat of the battle time can become our worst enemy. We use time checks to keep the IC attuned to the incident. The IC will request the specific length of time to be notified (ie every 15 mins, etc.) and this is used as a reminder that you did or did not meet your specific objectives. Other indicators are that the incident is expanding in complexity or size and that you have not gained control of it. | May 14, 2012 5:05 AM |
| 16 | Communications totally breakdown Accountability breakdowns Strategy changes quickly and resources re-deployed | May 11, 2012 7:22 AM |
| 17 | When one or more divisions or ICS assignments have become overwhelmed. | May 10, 2012 9:00 AM |

Page 7, Q7. ICS often uses benchmarks to determine incident progression or mitigation. As an incident unfolds, the situation can become chaotic, what benchmarks tell you that you have reached this point?

Please list these benchmarks and describe your observations.

- | | | |
|----|--|----------------------|
| 18 | <p>*A break down in communication on the radio between section / division leaders. Section leaders or initial command may be overwhelmed by noise levels, complexity of incident, more than one person giving them information or updates, and the size of the incident distracts the IC or section leaders to the point that their ability to pay attention to the radio is reduced, and therefore good back and forth by other units is not good. *Having to repeat commands, or radio transmissions not be acknowledged. Dispatchers or communication centers can become so noisy with multiple radios and telephones ringing that they are quickly overwhelmed. My experience is almost always with a communication center with 1 telecommunicator. One dispatcher / call taker will be quickly overwhelmed with the large incident beginning to develop, and additional calls coming in. *Units on scene being requested perform more than 1 task. Officers arriving on scene at this surge incident that are not practicing ICS properly early in an incident may start to give individual orders to incoming units. A clearly defined IC may have not been defined yet, or a command post may have not been established, and senior officers may be freelancing a little prior to a senior officer taking command and forcing people to utilize the ICS system and its protocols.</p> | May 10, 2012 4:07 AM |
| 19 | <p>Time is against you. Primary resources are near depletion. Water supply is not adequate.</p> | May 9, 2012 12:06 PM |
| 20 | <p>Your incident strategy fails due to a catastrophic scene occurrence. Your Command Staff communicates to you that the incident is out of control OR they don't communicate it but you can tell visually or listening to the radio. Safety excitedly issues an evacuation order when previously there was no verbal indication of any problem. Sudden violent venting of smoke or fire. Smoke explosion or backdraft. Sudden building collapse or partial collapse. Deployment of RIT. Rehab announces too many FFs are worn out.</p> | May 9, 2012 10:52 AM |
| 21 | <p>Loss of control Lack of reports and updates Loss or Lack of resource tracking and tasks assigned.</p> | May 9, 2012 4:44 AM |
| 22 | <p>When your initial plan is not working so you change tactics and that too is not working. Insufficient or lack of people and equipment so you are not able to change your plan.</p> | May 9, 2012 4:36 AM |
| 23 | <p>Operations are moving forward, but supports have not been addressed. "Reasonable" operational periods are passing without and plan for continuation. The "initial attack phase" has concluded without objectives for the next phase.</p> | May 8, 2012 6:26 PM |
| 24 | <p>For a structural event it's manpower, apparatus and fire control. Staffing is a key issue combined with the ability to man apparatus. I have three people on-duty plus myself. For the working fire it's how quickly a second piece can get on scene with staffing of call back people. In turn, this will allow me to make the interior attack, search out the fire, confinement and extinguishment. Our policy calls for 10 minute marks at structure fires or complex event. The mark will let me get an idea of what kind of progress is being made and whether to continue offensive or go to defensive mode. I also use the marks to measure productive capacity of personnel. Ten minutes in July with high humidity and temps tells me</p> | May 8, 2012 11:36 AM |

Page 7, Q7. ICS often uses benchmarks to determine incident progression or mitigation. As an incident unfolds, the situation can become chaotic, what benchmarks tell you that you have reached this point?

Please list these benchmarks and describe your observations.

	I need mutual fast Ten minutes of fire attack should begin to see flames getting under control. Ten minutes should show ventilation working.	
25	Having two or more different type of operations going on at the same time. Having to set up sector commands to effectively be able to run the command.	May 8, 2012 9:33 AM
26	Change in tactics from offensive to defensive Incident has or will overwhelm resources on scene	May 8, 2012 8:49 AM
27	1. span of control. I divide the building/event into divisions under ICS. If I have 4-7 I consider additional ICS resources. 3 alarms or greater, I seek local Incident Management team. If I cannot fill an assignment, particularly Safety, I call for additional resources. Intuition and experience	May 8, 2012 7:27 AM
28	Time vs progress, time can slip away without being prompted of the time. For example if resources are lacking at an event time can slip away and you don't realize you are beginning to lose the battle because you're so busy then it's too late and you are always playing catch up.	May 8, 2012 6:04 AM
29	The most telling is violation of span of control. When I have too many people reporting to me, and reporting a multitude of "little" things, I have lost control. I need to make additional command assignments, sectoring areas, assigning personal to other command positions such as staging, rehab, logistics, water supply, etc. It is far easier to build up positions early on, and then reduce as the need diminishes rather than falling behind and playing catch-up for the entire event.	May 8, 2012 5:36 AM

Page 8, Q8. Think about your experience responding to a routine single family residential structure fire. Imagine that the situation is showing signs of becoming non-routine (falling out of the ordinary). What are the signals that alert you to this transition.

Please provide a response in each of the ...

Fireground Activity		
1	Mayday call changes focus to the firefighter's issue	May 21, 2012 11:04 AM
2	lack of progress, uncoordinated activities	May 17, 2012 9:17 AM
3	Crews appear to be operating in catch up mode, despite efforts in place there does not appear to be a sense of urgency as to the changing (evolving) conditions	May 15, 2012 8:32 PM
4	personnel quickly moving among tasks/assignments	May 15, 2012 1:00 PM
5	fire is expanding while patient/victim care is being attended to	May 15, 2012 7:37 AM
6	Discovery of occupant loss of life during primary or secondary search.	May 14, 2012 4:31 PM
7	Water supply is lost or becomes unreliable	May 14, 2012 1:31 PM
8	No progress is being made and ICS starts to unravel. Safety is being compromised.	May 14, 2012 12:24 PM
9	In the absence of proper control / direction fire companies may begin to freelance	May 14, 2012 12:14 PM
10	Updated reports from crews are raising concerns. Visual observations of current fire conditions. Situations such as water supply and access have been reported.	May 14, 2012 8:06 AM
11	Personal observations upon arrival and a report from a civilian.	May 14, 2012 7:03 AM
12	Noticable tension in radio reports	May 14, 2012 6:41 AM
13	a sudden increase in the fire or smoke condition	May 14, 2012 6:31 AM
14	Incident Commander	May 14, 2012 5:53 AM
15	Rapid Intervention Team activation for a downed firefighter, loss of water supply, unable to ventilate safely, delayed response, overwhelming life safety concerns (so many victims or rescues that need to be performed), multiple calls occurring while dealing with the structure fire.	May 14, 2012 5:36 AM
16	People are overwhelmed and have difficulty making correct decisions towards mitigation that decrease safety of personnel	May 11, 2012 7:27 AM
17	Flashover or backdraft while interior crews are working	May 10, 2012 9:14 AM
18	Units on scene tend to speak very loudly, or "yell" into their radios as if that makes people hear them better.	May 10, 2012 4:31 AM
19	incomplete PAR reports	May 9, 2012 12:06 PM

Page 8, Q8. Think about your experience responding to a routine single family residential structure fire. Imagine that the situation is showing signs of becoming non-routine (falling out of the ordinary). What are the signals that alert you to this transition.

Please provide a response in each of the ...

20	FFs too excited for the situation: more hoselines or venting or calls for search	May 9, 2012 10:57 AM
21	Looks chaotic or uncoordinated, assigned tasks not getting completed.	May 9, 2012 5:03 AM
22	That the fire is getting ahead of your efforts and is not stopping even after deploying more resources on it	May 9, 2012 5:00 AM
23	Companies operating independently and not toward a common objective	May 8, 2012 6:32 PM
24	Ability to gain entry and get to the seat of the fire.	May 8, 2012 11:53 AM
25	Person trapped inside structure, problem with primary water source.	May 8, 2012 9:46 AM
26	Physical signs; smoke texture, color, velocity and behavior,	May 8, 2012 7:32 AM
27	chaos, things not clicking, murphys law	May 8, 2012 6:17 AM
28	Conflicting reports, reports not matching the visuals, firefighters not being able to achieve an assigned objective, worsening conditions	May 8, 2012 6:03 AM

Incident Progression

1	The incident continuing to grow beyond our prior experiences	May 21, 2012 11:04 AM
2	escalating incident, conditions get worse	May 17, 2012 9:17 AM
3	Fire appears to be advancing despite offensive operations and handline placement and advancement	May 15, 2012 8:32 PM
4	percentage of involvement increasing rather than decreasing	May 15, 2012 1:00 PM
5	fire has extended beyond the initial areas after arrival. Collapse is imminent or has occurred	May 15, 2012 7:37 AM
6	Failure to have adequate resources initially or delayed mutual aid response.	May 14, 2012 4:31 PM
7	Structural concerns (such as roof or floor collapse) early in an incident	May 14, 2012 1:31 PM
8	Chaos sets in, no progress made.	May 14, 2012 12:24 PM
9	Fire conditions are not improving	May 14, 2012 12:14 PM
10	Actual reports are confirming questionable results. Visual observations confirming previous concerns and factors such as issues with water supply and accessibility have been confirmed.	May 14, 2012 8:06 AM
11	Limited fire control operations while extensive search and rescue operations were being conducted	May 14, 2012 7:03 AM
12	Personnel have uncertainty of what is going on	May 14, 2012 6:41 AM

Page 8, Q8. Think about your experience responding to a routine single family residential structure fire. Imagine that the situation is showing signs of becoming non-routine (falling out of the ordinary). What are the signals that alert you to this transition.

Please provide a response in each of the ...

13	time elapsing and no visible improvement in the fire extinguishment	May 14, 2012 6:31 AM
14	large single family house (8,000 sq ft). Fire would not go out.	May 14, 2012 5:53 AM
15	Unable to contain the fire, exposures that were threatened become involved,	May 14, 2012 5:36 AM
16	Fire suppression not advancing to extinguish fire	May 11, 2012 7:27 AM
17	Unexplained/unexpected delays in water supply availability (especially in rural environment)	May 10, 2012 9:14 AM
18	Initial command on scene immediately calling for more help than they normally call for.	May 10, 2012 4:31 AM
19	Structural integrity compromised	May 9, 2012 12:06 PM
20	Another alarm called for beyond what is normal	May 9, 2012 10:57 AM
21	Incident is not responding to the expected outcome of task	May 9, 2012 5:03 AM
22	Taking over more of the structure than anticipated, becoming more than your resource at the scene can handle	May 9, 2012 5:00 AM
23	Fire is knocked down and the same companies are overhauling	May 8, 2012 6:32 PM
24	Reading smoke conditions for thickness, pressure, presence of flames inside the smoke.	May 8, 2012 11:53 AM
25	Fire progressing getting away from suppression teams	May 8, 2012 9:46 AM
26	Unable to extinguish main body of fire, fire is past area of origin	May 8, 2012 7:32 AM
27	2+2 = 5 your normal attack is not working	May 8, 2012 6:17 AM
28	The "routine" fire should show signs of improvement within minutes of on scene aggressive attacks. If it doesn't, well, as the saying goes, "here's your sign".	May 8, 2012 6:03 AM
Personal Decision-making		
1	The stress and demands upon the I.C. to coordinated all the roles	May 21, 2012 11:04 AM
2	risk based analysis shows signs that are outside the norm	May 17, 2012 9:17 AM
3	Ensure crews are actively seeing the cues of the changing environment in front of them, if needed provide verbal prompting via radio commo to keep them apprised of changing conditions	May 15, 2012 8:32 PM
4	Overwhelming amount of information being delivered in short time period	May 15, 2012 1:00 PM
5	The ICS is overwhelmed and the IC is actively involved in operational activity.	May 15, 2012 7:37 AM

Page 8, Q8. Think about your experience responding to a routine single family residential structure fire. Imagine that the situation is showing signs of becoming non-routine (falling out of the ordinary). What are the signals that alert you to this transition.

Please provide a response in each of the ...

6	Risking a life to save a life situations.	May 14, 2012 4:31 PM
7	Start double-guessing myself	May 14, 2012 1:31 PM
8	Becomes harder and options are running out	May 14, 2012 12:24 PM
9	Information overload, too many individuals reporting to IC. Span of control is being lost.	May 14, 2012 12:14 PM
10	Risk and benefit. Prioritizing the resources on scene to insure safety and to mitigate situation. Verbal reports from Safety officer, other Command personnel and members involved in the incident are crucial at this point to allow the IC to make proper decisions. This is where all information needs to be received and processed and a timely decision made based on facts.	May 14, 2012 8:06 AM
11	Realizing the need for a large deployment of fire and EMS resources more targeted toward a commercial/institutional operation rather than a SFD.	May 14, 2012 7:03 AM
12	Personnel are requesting many actions/ resources to occur.	May 14, 2012 6:41 AM
13	having a feeling of urgency,	May 14, 2012 6:31 AM
14	Insure that all utilities were shut off, went to exterior operations, increased amount of "A" foam being applied from hose lines, called additional alarm for manpower	May 14, 2012 5:53 AM
15	Everyone has a structure fire that when in Command, nothing goes right. No matter what is tried, the fire continues to gain headway and the level of concern and frustration grows.	May 14, 2012 5:36 AM
16	Seeking additional resources on scene that are not there	May 11, 2012 7:27 AM
17	Delays in decision making because of being overwhelmed with requests from subordinates, lack of accurate information, or rapidly evolving events	May 10, 2012 9:14 AM
18	Feeling a sense of needing to move more quickly with a sense of urgency. This can be a problem in my experience because I believe that slower more deliberate and well thought out steps are much more effective.	May 10, 2012 4:31 AM
19	poor communication with other sector chiefs	May 9, 2012 12:06 PM
20	Not crisp like usual. Odd requests	May 9, 2012 10:57 AM
21	Start making poor decisions or rapid decisions using poorly based tactics	May 9, 2012 5:03 AM
22	Becoming overwhelmed, unable to reformulate a plan of change	May 9, 2012 5:00 AM
23	Fully reactive and not ahead of current operations	May 8, 2012 6:32 PM
24	Lack of appropriate progress within a reasonable time frame to the decision	May 8, 2012 11:53 AM

Page 8, Q8. Think about your experience responding to a routine single family residential structure fire. Imagine that the situation is showing signs of becoming non-routine (falling out of the ordinary). What are the signals that alert you to this transition.

Please provide a response in each of the ...

25	Operations on all sides and multi floors	May 8, 2012 9:46 AM
26	Time of day, weather conditions, time of response time due to other activities and experience of crews	May 8, 2012 7:32 AM
27	get your head around the big picture. Sometimes it is harder than others	May 8, 2012 6:17 AM
28	I am a firm believer in using the "SLEEVES" method of strategic decision making on a fire ground. Size-up/sufficient help, life safety, exposures, entry, ventilation, extinguish, salvage and overhaul. This will work for every size fire event. However, when I question it, or through it out the window, that's a sign that I am getting frustrated with this event that doesn't seem to be conforming to the norm. Additionally, I am hard on myself, and when I begin to question my decisions, doubt enter the equation, and typically there is no room for that at an emergency scene.	May 8, 2012 6:03 AM
Other Signals		
1	Staff getting stressed, fatigued and taking actions beyond SOP's	May 21, 2012 11:04 AM
2	gut feeling	May 17, 2012 9:17 AM
5	Fire behaviour is abnormal (drug labs) unusually high number of victims(group home), PD on scene crime scene	May 15, 2012 7:37 AM
7	Anxiety level evident in the voices on the radio communications	May 14, 2012 1:31 PM
10	Escalating incident and elevated level of communications concerns both from the reports themselves but also from the tone and method they are delivered.	May 14, 2012 8:06 AM
12	No clear (or breakdown of) command structure.	May 14, 2012 6:41 AM
13	personnel on the fire ground are starting to have a heightened excitement level	May 14, 2012 6:31 AM
14	Location of incident, time of day, duration of incident.	May 14, 2012 5:53 AM
15	Becoming emotionally involved with the incident, unable to remove emotion from the objective.	May 14, 2012 5:36 AM
16	May Day signals, reports of trapped people	May 11, 2012 7:27 AM
18	I typically listen to the police department radio frequency. When a fire incident is growing, police units on scene will communicate this back to the dispatcher to tell fire units to hurry, and to bring more. This will almost always be an indicator.	May 10, 2012 4:31 AM
20	Mayday: Safety orders evacuation	May 9, 2012 10:57 AM
21	Concern raised by others	May 9, 2012 5:03 AM
22	changes in the event adding more problem that were not seen from the initial	May 9, 2012 5:00 AM

Page 8, Q8. Think about your experience responding to a routine single family residential structure fire. Imagine that the situation is showing signs of becoming non-routine (falling out of the ordinary). What are the signals that alert you to this transition.

Please provide a response in each of the ...

	attack, possible another incident i.e. Unknown Hazmat situation	
23	Too focussed on the current picture, narrowing command to too small of a unit or detail	May 8, 2012 6:32 PM
24	Inability to establish a reliable water supply, accountability for fire personnel and victims, lack of mutual aid in a timely manner.	May 8, 2012 11:53 AM
25	Need to set up the IC system and fill out position to manage the problems that have occurred	May 8, 2012 9:46 AM
26	Outside information-rescue, HAZMAT, etc.,	May 8, 2012 7:32 AM
27	lack or bad communications, poor frequent updates	May 8, 2012 6:17 AM

Page 8, Q9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation?

Please provide a response in each of the three areas listed below:

Emergency Scene Activity		
1	The number of patient exceeding our ability to transport.	May 21, 2012 11:04 AM
2	heavy fire conditions, report of people trapped,	May 17, 2012 9:17 AM
3	Multi story ALF with a stainless steel chimney stack running through the center of the building. Initial call was to a smoke alarm. On first arrival of units they were still functioning in Fire Alarm mode	May 15, 2012 8:32 PM
4	situation reports from various areas of incident indicating deterioration of situation	May 15, 2012 1:00 PM
5	Confusion in strategies and tactics Offense or DEfense and they are simultaneously occurring	May 15, 2012 7:37 AM
7	Responders start shouting to each other or over the radio	May 14, 2012 1:31 PM
8	A very large area of the community is effected and not enough resources.	May 14, 2012 12:24 PM
9	The incident involved a large area brush fire which was difficult to manage all the resources and evaluate the need for additional resources.	May 14, 2012 12:14 PM
10	Fire in 2 1/2 story multi family on a summer day. Reported basement fire.	May 14, 2012 8:06 AM
11	Initial units arriving on scene having difficulty getting even initial tasks completed effectively or quickly.	May 14, 2012 7:03 AM
12	Busy - many different tasks occurring at once.	May 14, 2012 6:41 AM
13	The fire was getting beyone the water supply capability very quickly	May 14, 2012 6:31 AM
14	Building Fire in Grocery Store. I was standing across the street from the building when I noticed a large crack on the AID Corner of the building.	May 14, 2012 5:53 AM
15	Incident Commander of a community wide hurricane effort including evacuation of several housing projects, nursing homes, hazmat response and a building fire. Incidents were broken down into divisions with a Captain handling each and my role was overseeing the entire effort.	May 14, 2012 5:36 AM
16	Fire in multi unit baloon frame structure	May 11, 2012 7:27 AM
17	Single family house fire--interior crew on second floor was transitioning to overhaul when a backdraft occurred while pulling ceilings.	May 10, 2012 9:14 AM
18	Police department units determining that they are not safe in the area, and they begin to pull back and set up a perimeter. Up to this point they typically rush into the incident until they discover the hazards, then they will typically identify that it is a fire incident and back off.	May 10, 2012 4:31 AM

Page 8, Q9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation?

Please provide a response in each of the three areas listed below:

19	Lack of resources	May 9, 2012 12:06 PM
20	Can't find fire but there is plenty of smoke	May 9, 2012 10:57 AM
21	Too many different scenes	May 9, 2012 5:03 AM
22	Automatic Fire Alarm in a commercial building, initial response stating fire is out, arrive at scene to only have the situation develop rapidly into a First alarm assignment	May 9, 2012 5:00 AM
23	Preplans ignored, ad lib response	May 8, 2012 6:32 PM
24	Major high-pressure gas main leak. Ruptured line with gas company personnel in the trench and detail police nearby. Seal off area at 3 pm on a school day and this was a main access road in this part of town.	May 8, 2012 11:53 AM
25	MCI road race wind storm blew down there tents and had to set up make shift centers with minimul staff and equipment.	May 8, 2012 9:46 AM
26	A reported plane crash. I knew we would have multiple agencies involved, as well as large scale communication concerns. Multipple discipline response	May 8, 2012 7:32 AM
27	Fire attack	May 8, 2012 6:17 AM
28	Major Flood	May 8, 2012 6:03 AM
Incident Progression		
1	Lack of progress on contolling the incident, having to triage and ration our response	May 21, 2012 11:04 AM
2	fire spread to adjacent structures, companies failed to take proper positions, stairs had burned out inside	May 17, 2012 9:17 AM
3	units were still looking for the cause of the activation, with no clear thought process of the obvious starrng at them. An isolated inadequately protected smoke stack penetrating through multiple floors with smoke permiating through out the structure, yet not activities to begin active search of origin/cause has been initiated by initial OS CO	May 15, 2012 8:32 PM
4	extended time of operation without significant improvement	May 15, 2012 1:00 PM
5	Exposures became involved	May 15, 2012 7:37 AM
7	Safety of personnel becomes compromised	May 14, 2012 1:31 PM
8	More effected areas that were impacted by this event that we did not know prior.	May 14, 2012 12:24 PM
9	Rapidly spreading fire, pushed by high winds. The fire was moving faster than we could get resources in place to fight it	May 14, 2012 12:14 PM

Page 8, Q9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation?

Please provide a response in each of the three areas listed below:

10	On arrival called a working fire with smoke showing. 2nd alarm sounded shortly thereafter to fill out alarm assignment. Interior attack started by the 5 members on duty with 2 lines extended into the basement. Additional crews ordered to provide a water supply and assist in possible ventilation. Original crews had fire knocked down but they had concerns about chases and balloon construction. The fears were accurate in that fire had progressed up through the middle of the house.	May 14, 2012 8:06 AM
11	Incident continued to grow despite FD efforts. Every progress report indicated no progress and that in fact that we were losing ground/experiencing difficulties.	May 14, 2012 7:03 AM
12	Situation escalating - not under control	May 14, 2012 6:41 AM
13	more and more areas began to burn due to heavy wind condition and lack of water supply	May 14, 2012 6:31 AM
14	Building collapsed almost immediately after I noticed the crack.	May 14, 2012 5:53 AM
15	Incident progression continued to grow at an amazing rate to include huge numbers of state assets being dispatched without being requested and the need to handle those as well.	May 14, 2012 5:36 AM
16	Fire spread vertically and horizontally ahead of firefight	May 11, 2012 7:27 AM
17	Event went from "under control" with overhaul in progress to an additional alarm.	May 10, 2012 9:14 AM
18	Upon arrival all workers in a manufacturing facility had evacuated, and were gathering to brief the incoming commander.	May 10, 2012 4:31 AM
19	firefighter safety being compromised	May 9, 2012 12:06 PM
20	visible fire at roofline - roof collapses in 11 min. after arrival of FD	May 9, 2012 10:57 AM
21	Calls stacking up	May 9, 2012 5:03 AM
22	Routine automatic fire alarm, people on scene stating that the fire is out that was in a kettle, to only have the fire spread into the drop ceiling at the time we arrived, realizing at the time we had high potential to losing the building	May 9, 2012 5:00 AM
23	Incident ran away with command and response exceeded the situation, dramatically	May 8, 2012 6:32 PM
24	Major leak effecting 86 residences. School was letting out for day as well as people coming home from work. All wanted access to their homes. Limited manpower. Had to split forces with the CP blocking off one street and the engine company blocking off the other side	May 8, 2012 11:53 AM
25	Triage not enough EMS personnel to treat and transport the victims	May 8, 2012 9:46 AM
26	As we progresses, we are not solving the problem. Chain of command asking for	May 8, 2012 7:32 AM

Page 8, Q9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation?

Please provide a response in each of the three areas listed below:

	resources	
27	new information of possible victim	May 8, 2012 6:17 AM
28	Living in an area NOT prone to flooding, the 100 year storm took everyone by surprise. What started out as a typical rain fall quickly overtook local dams, ponds, and rivers. People were trapped in homes and complete neighborhoods. Citizens needed sand bags, rescue, medical aide, and controlled evacuation. A lake needed to be lowered as quickly as possible and that required the use of huge pumps that had to be located and manned. Manpower was supplied by the Fire, police, and DPW departments. Additional personnel came from the national guards. FEMA got involved along with MEMA. When I arrived at the Incident Command Center everyone was doing their own thing. Duplication of effort was apparent. Priorities were not organized.	May 8, 2012 6:03 AM
Personal Decision Making		
1	Increasing stress in managing the incident as demands to address the various issues increases.	May 21, 2012 11:04 AM
2	command post location provided poor view of the structures	May 17, 2012 9:17 AM
3	Arrived on scene as first chief officers, obtained info that an existing hazard still existed and changed call type to commercial structural fire prompting additional resources of 3 engines, 1 aerial and other staff	May 15, 2012 8:32 PM
4	numerous recommendations from incident sectors without the benefit of the others required strong thought process	May 15, 2012 1:00 PM
5	A single incident quickly became multiple incidents within the initial incident	May 15, 2012 7:37 AM
7	Sense that I don't have a complete picture of what's going on	May 14, 2012 1:31 PM
8	Became cumbersome with lack of command staff to carry out all functions.	May 14, 2012 12:24 PM
9	The inability to see the big picture in the beginning of the incident made decision making difficult. We needed additional command staff around the incident to feed information back to the IC.	May 14, 2012 12:14 PM
10	Additional crews requested, accountability was critical along with an effective water supply and ladder work. Assignment of additional command members from other departments was instrumental in the outcome as we do not have sufficient resources available.	May 14, 2012 8:06 AM
11	Be faced with decisions on whether the correct incident control/tactical decisions will have significant financial implications to the community (put 500+ people out of work at least temporarily).	May 14, 2012 7:03 AM
12	Throwing more resources at same problem - not stepping back to rethink and regroup.	May 14, 2012 6:41 AM

Page 8, Q9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation?

Please provide a response in each of the three areas listed below:

13	the need to continue to call in additional mutual, very quickly	May 14, 2012 6:31 AM
14	Attempted to get two crews out from the front of the building before collapse. One crew was caught in the collapse trapping two members under the wall.	May 14, 2012 5:53 AM
15	my personal decision making included keeping the priorities of my community first and assisting the state assets and needs as second.	May 14, 2012 5:36 AM
16	Assignment of resources quickly was difficult to maintain	May 11, 2012 7:27 AM
17	Because of "under control" decision, crews were beginning to stand down. RIT was not immediately available.	May 10, 2012 9:14 AM
18	Persons with knowledge of the dangers involved in this haz mat incident were moving to clear the area.	May 10, 2012 4:31 AM
19	transitioning to defensive firefighting operations.	May 9, 2012 12:06 PM
20	FFs upon exit don't report to their company	May 9, 2012 10:57 AM
21	Step back and look at the whole situation	May 9, 2012 5:03 AM
22	Not enough personnel on initial assignment, realizing the potential of losing the building, requesting a first alarm assignment to help mitigate the situation hoping that it was not too late	May 9, 2012 5:00 AM
23	Incident commander allowed support agencies to overtake objectives	May 8, 2012 6:32 PM
24	Need to notify multiple agencies that included Highway Dept, PD, Schools and School bus company. Ability to get a handle on potential people effected and any victims as well an accountability of residents.	May 8, 2012 11:53 AM
25	Activated a ambulance taskforce, set staging area for ambulances and assigned person to track all victims and where they went	May 8, 2012 9:46 AM
26	Intuition, collaboration with my staff and mutual aid staff	May 8, 2012 7:32 AM
27	change focus	May 8, 2012 6:17 AM
28	After 5 minutes of listening to and watching the sheer chaos going on in the EOC I made a decision. I told the mayor that I was in charge and the police chief and I would run the operations and everything needed to go through us. We asked for and received maps, available personal figures, equipment availability, and prioritized requests for assistance. All communications were routed through the EOC. While representatives from FEMA, MEMA, National guard, the County Sheriff's office (the inmates were a great source of manpower), City water/sewer and DPW, national grid, planning and building department were present, all decisions went through me. I utilized my experiences in dealing with multiple agencies, large numbers of subordinates, and setting priorities, and listening to those closest to the problem in making my decisions.	May 8, 2012 6:03 AM

Page 8, Q9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation?

Please provide a response in each of the three areas listed below:

Other Signals		
1	Plans and resources not effectively resolving the issue at hand	May 21, 2012 11:04 AM
2	gut feeling, uneasy, dry mouth,	May 17, 2012 9:17 AM
3	Crews seemed to have honed in on the routine of responding to this structure as a chronic fire alarm activation and fell short of expectations of thinking outside the box in seeing the obvious.	May 15, 2012 8:32 PM
5	Insufficient resources.	May 15, 2012 7:37 AM
6	Can't identify any fire situations I have experienced that surged into a complex or non routine situation.	May 14, 2012 4:31 PM
7	Having to take a breath to collect my thoughts and become grounded	May 14, 2012 1:31 PM
10	Heat factor was a major issue and should have been better addressed in this incident. Additional resources should have been rotated in and utilized. The signal that was most the glaring is the heat and construction with the initial knockdown lending to the belief that the situation was under control.	May 14, 2012 8:06 AM
14	None at the time.	May 14, 2012 5:53 AM
15	every community neighboring mine was also hugely impacted thus eliminating the possibility of mutual aid and outside help.	May 14, 2012 5:36 AM
16	too many tasks to complete and not enough personnel	May 11, 2012 7:27 AM
18	Information from the IC on scene, together with a sense of urgency for you to take over this incident or set up unified command, not because the IC feels that he has to pass the incident off, but that your level or technical ability may exceed his, and the IC wants you to quickly join him or her	May 10, 2012 4:31 AM
20	Failure of ladder co. to recognize danger of fire on roof	May 9, 2012 10:57 AM
22	Staying on your game even when people stating that the fire is out and it was not really out and knowing that even the routine incidents can lead into or transform into a chaotic situation	May 9, 2012 5:00 AM
23	Unqualified individuals were allowed too much influence on the IC	May 8, 2012 6:32 PM
24	It was January, temp of 15 degrees. Very high winds helped with dispersing gas but too dangerous to use water spray. Gas company officials worked at CP in getting gas shut off to the area and in shutting off power. Need for additional manpower for checking homes, multiple safety officers needed to monitor.	May 8, 2012 11:53 AM
25	medical persons assigned to event were not enough to be able to treat the number of victims.	May 8, 2012 9:46 AM

Page 8, Q9. Pick a situation that you experienced where a routine event surged into a complex or non routine situation. What were the signs of this transformation?

Please provide a response in each of the three areas listed below:

26	Outside information	May 8, 2012 7:32 AM
27	complacency, Interior crews passive not communicating basic objectives	May 8, 2012 6:17 AM

Page 9, Q10. Thinking about the situation that you utilized in question 9, were there any signals that you expected to see that were not present?

1	The lack of coordination between the private and public ambulance responses. The lack of a staging officer and self dispatching to answer a call, not being directed by a control point. The dispatcher was announcing the call and the responses were multiple units responding.	May 21, 2012 11:07 AM
2	Crews were not engaged in proactive activities consistent with on scene visual cues that were present, lightly smoke charged, bldg, residents still in place with the affected area of bldg, obvious potential source of smoke in the direct area of concern.	May 15, 2012 8:34 PM
3	I answered that I could not identify any non routine situations I have encountered.	May 14, 2012 4:32 PM
4	Expected someone else to have communicated that conditions were becoming untenable, or they needed more resources.	May 14, 2012 1:32 PM
5	This fire seemed so routine. Fire in B/C corner first floor already venting. 2" line in through front door. As soon as the company hit fire with water, it was like an explosion instead of darkening down. I expected to see steam transfer and smoke color changes. Instead the fire grew in intensity and the smoke went jet black almost like a petroleum product had been put on the fire instead of water.	May 14, 2012 6:00 AM
6	All the signals were there and we actually planned for the event weeks ahead of time. Impact of the event grossly exceeded our planning.	May 14, 2012 5:36 AM
7	No exterior signs of fire or pressurized smoke in the attic space.	May 10, 2012 9:16 AM
8	In this incident there was a significant acid plum. One expects a plum to be a green cloud clearly defined and obvious. In this case it was large, dangerous, but almost just seemed to be normal steam, or a fog or mist like cloud. It almost looked like a normal situation.	May 10, 2012 4:35 AM
9	Through our firefighting training, our firefighters were able to rescue a fallen firefighter prior to RIT activation.	May 9, 2012 12:06 PM
10	Earlier presence of visible flame, especially higher in structure.	May 9, 2012 10:59 AM
11	When we looked for the extension of the fire we realized that we had grease laden vapors in that space and could have possibly lost the entire building and most importantly lost lives due to building collapse. Expected to see more signs of fire spread instead of lack of fire spread. Second question was this was a clean building how did this go unseen?	May 9, 2012 5:06 AM
12	Large amount of injuries	May 9, 2012 5:05 AM
13	I've always been taught to best disburse gas by a hose stream. A 4" feeder was established and several handlines set up. Before we began to charge lines the gas company rep advised us using water could create more problems by creating a humidity situation that could actually drive the gas plum down close to the ground. It was a little unnerving to have residences within 50' of a major break and no line operating.	May 8, 2012 11:59 AM
14	Physical signs, smoke and debris, other reports	May 8, 2012 7:34 AM

Page 9, Q10. Thinking about the situation that you utilized in question 9, were there any signals that you expected to see that were not present?

- | | | |
|----|--|---------------------|
| 15 | There is an expectation of interior crews to assume victims could be present when they do not have that in the back of their mind as they progress conducting primary searches if possible | May 8, 2012 6:21 AM |
|----|--|---------------------|

Page 9, Q11. If you answered Yes to Question 10, how did you interpret and react to the absence of these expected signals?

1	Created a staging location and radio instructions for only responding unit will be selected by the staging officer and forwarded to dispatch to deploy	May 21, 2012 11:07 AM
2	See 10	May 15, 2012 8:34 PM
3	That the responders had tunnel vision, and weren't seeing the big picture	May 14, 2012 1:32 PM
4	I was shocked. I immediately had the crews back out to a safer position, had the second engine pull a 2 1/2" line into position and had the truck companies perform additional ventilation. This was instinctive I believe. I also thought for a moment that we may have had a contaminated water supply which was affecting the fire's behavior. We had the third alarm companies establish a different water supply on a different grid.	May 14, 2012 6:00 AM
5	I accepted the recommendation of the interior ops officer to determine the fire "under control".	May 10, 2012 9:16 AM
6	I knew that earlier radio reports were indicating that something bad had happened. A leak may be occurring, and that this cloud may be dangerous.	May 10, 2012 4:35 AM
7	Once this incident occurred, we realized the floor of the structure was compromised and were able to take necessary precautions	May 9, 2012 12:06 PM
8	Operations ordered more ventilation which eventually revealed the fire.	May 9, 2012 10:59 AM
9	How did this go in seen prior to the fire. Initially shocked, very clean building with new equipment, did not expect this situation in this commercial building	May 9, 2012 5:06 AM
10	Was able to free up EMS resources to respond on investigation type calls	May 9, 2012 5:05 AM
11	The gas company representative was my "subject-matter expert". It felt quite uneasy to not take the steps I wanted to take but I had to trust him and that his experience in the matter far exceeded anything I've ever had	May 8, 2012 11:59 AM
12	I felt there was a possibility we would have to apply large human resources to a search	May 8, 2012 7:34 AM
13	Frustrated, throwing more resources at it which requires more accountability	May 8, 2012 6:21 AM

Page 10, Q12. Do you utilize different decision-making strategies as an incident becomes unfamiliar and unpredictable?

1	Yes the significant number of patients was unpredictable, had to identify the staff that could maintain the control and understood how there role would function. Assigned personnel that would merge the incoming resources and not get involved in other activities. The position coordination established a controlled response.	May 21, 2012 11:10 AM
2	I changed from a tactical strategy of attempting to suppress the fire to the strategic view of self preservation (protecting my firefighters from danger). This change from offensive to defensive felt very different. As the initial offensive strategy failed to make progress and the incident escalated, I became nervous and scared. I remember getting very dry mouthed. However, once I ordered the defensive strategy I immediately felt relief.	May 17, 2012 9:21 AM
3	attempt to ensure that the reliance of information is flowing more frequently and potentially from more than one source. Potentially looking towards senior staff with greater experience to provide potentially pivotal updates on scene conditions.	May 15, 2012 8:37 PM
4	I will change strategies. If I believe that the incident is not acting as I would predict, I step back, use a defensive strategy and reevaluate the situation. I also rely on my other command staff or officers for feedback to get their perspective.	May 15, 2012 7:41 AM
5	I would more readily call for mutual aid and other outside resources as the incident became more complex, unfamiliar and unpredictable.	May 14, 2012 4:35 PM
6	Our priorities of life safety, incident stabilization and property preservation remain constant. Therefore, those are the touchstones by which all decision-making is conducted.	May 14, 2012 1:34 PM
7	To be more adaptive and put more trust in other officers to help manage the situation.	May 14, 2012 12:27 PM
8	I look to other officers to assist in evaluating and interpreting the incident. By gathering as much information (getting the big picture) as possible the command team can use their collective experiences to help make a better decision.	May 14, 2012 12:14 PM
9	I believe you have to be consistent and that all incidents wither familiar or unfamiliar should be treated the same. Good practices for routine events and normal situations will carry over in an unfamiliar one and I believe will result in a greater chance of success. The only difference is in accessing resources and utilization and logistics of using them that would be different but should follow along under similar operational procedures.	May 14, 2012 8:08 AM
10	My overall incident priorities are going to remain the same: Life Safety, Incident Stabilization and Property Conservation. What I do is still try to take my own knowledge and experience base, try to relate it to the unfamiliar territory that I am now operating in and attempt to expand my decision making process to meet the needs of the current incident.	May 14, 2012 7:09 AM
11	During "routine" incidents follow mental flow chart of what needs to happen next and make sure all bases are being covered. Once something unexpected occurs start to quickly analyze what is happening, what could happen, cost/benefit of actions, and formulate a plan for mitigation, including bringing in	May 14, 2012 6:46 AM


Page 10, Q12. Do you utilize different decision-making strategies as an incident becomes unfamiliar and unpredictable?

	others to get their opinion/suggestions.	
12	If a situation becomes unfamiliar or unpredictable I utilize the help and support of mutual Chiefs who have responded on the request for assistance.	May 14, 2012 6:33 AM
13	To be honest, I have no way to really explain my decision making strategies. I think that 25 years of experience have engrained a number of experiences from which I utilize to handle the situation in front of me. First and foremost is to get as accurate a picture of the situation as possible as soon as possible. Make initial decisions based on that information and modify the plan as we proceed. I have always believed in moving additional companies sooner so that they are available for deployment sooner. Keeping companies intact and having defined missions/roles for them upon deployment is also important.	May 14, 2012 6:04 AM
14	Priorities were determined based on the greatest need and where the limited resources available would have the most profound impact. Events within the Hurricane that normally would be significant based on their own merit became part of the larger community wide effort. For example during the height of the hurricane-my department responded to a well involved cellar fire in a single family home. Single engine response with one ladder company as back up. There wasn't anyone else available to respond. So while the community was hugely impacted by the hurricane a single family dwelling fire that would normally require more resources and personnel was handled with a single engine company.	May 14, 2012 5:40 AM
15	The approach to the decision making is much more conservative and a more thought out process. May confer with others more knowledgeable to the situation and work with them in an effort to develop a strategy for overall mitigation of incident.	May 11, 2012 7:31 AM
16	I call upon additional command resources for assistance and expand the number of personnel assigned to the command post.	May 10, 2012 9:18 AM
17	Calling for senior staff early. Try to slow things down, and help people to relax. Show a sense of confidence to others to help them feel secure, and that the situation is being handled. Set up a secondary communication center to take the load off of the primary PSAP/dispatch center. Clearly give a sense of "you are in command, and that directions need to be acknowledged", and require section leaders to get answers to questions and report back to you.	May 10, 2012 4:40 AM
18	We always work with firefighter safety being top priority.	May 9, 2012 12:06 PM
19	Yes, as an incident changes you need to adapt to those changes with possible different decision-making strategies. If your initial incident is a routine motor vehicle accident to find upon arrival that you have more patients than you can handle you need to decide how you are going to mitigate the situation and call for an MCI, possible air transport or ground, trauma center if you have one in the area. Your decision making skills need to be dynamic in nature, and should continually reassess your situation and decision making.	May 9, 2012 5:13 AM
20	I think it is important to keep reassessing the situation. Stepping back and getting additional input on what is going on. Trying to determine the total scope	May 9, 2012 5:06 AM

Page 10, Q12. Do you utilize different decision-making strategies as an incident becomes unfamiliar and unpredictable?

	of what is going on.	
21	Because a consistent thought/decision process allow my energy and focus to be upon the elements of the emergency and objectives and not on trying to remember what I forgot to think about. Because by using a repetitive process, I can best utilize the lessons of past incidents.	May 8, 2012 6:36 PM
22	Yes, I try to seek out people that have a specialty in this area. I bring them into the CP, get their expertise, give them the situation we're facing and ask for their input. An incident involving a suspected meth lab had me using this approach. Meth labs were not that popular in the area, yet, but the PD officer on scene had been to a training class recently. I still remember turning to him and saying he has more understanding of this situation than I and that I will look to him in helping me make decisions.	May 8, 2012 12:04 PM
23	Would look to experts to assist me in making decisions.	May 8, 2012 9:48 AM
24	I seek assistance from resources that have experience in managing problems I have not faced or am unfamiliar with. SWAT team events, plane crashes, large utility incidents etc..	May 8, 2012 7:35 AM
25	Try to maintain a risk vs. gain approach based on resources available, life hazard being first priority.	May 8, 2012 6:23 AM

1. I agree to participate in this study. I understand that by agreeing to participate and clicking "yes" I do not waive any of my legal rights.

		Response Percent	Response Count
Yes		100.0%	24
No		0.0%	0
answered question			24
skipped question			0

2. Please enter your assigned coded control number in the box below:

	Response Average	Response Total	Response Count
Assigned Coded Control Number	4,779.52	100,370	21
answered question			21
skipped question			3

3. Surge events require more resources than are readily available. When encountering surge events such as a Mass Casualty Incident (MCI) what strategies do you employ to get ahead of the event?

	Response Count
	20
answered question	20
skipped question	4

4. During large events, what regional strategies have been developed in your area to compliment the initial response?

Response
Count

20

answered question 20

skipped question 4

5. Often during chaotic events, the first few hours of response lack the required resource capability, how do you compensate?

Response
Count

20

answered question 20

skipped question 4

6. During large, unfamiliar events the level of information directed toward the incident commander is often overwhelming. How do you manage and filter this information flow?

Response
Count

20

answered question 20

skipped question 4

7. As a reminder during the first survey, you were asked to identify signals that an event is becoming unpredictable, unfamiliar or chaotic. Analysis of the responses to round one identified 18 themes by consolidating similar responses. As an example, responses including stress on the incident commander, anxiety, confusion, and dry mouth were consolidated into the theme of overwhelmed. The following listing summarizes the response from the group of participants and identifies 18 themes which are listed from highest to lowest in terms of response frequency. Please rate each of the items below in terms of how important the signal would be to you in terms of indicating a situation is becoming unpredictable or chaotic.

	Not Important					Extremely Important	Rating Average	Response Count
Lack of sufficient information (situational analysis)	0.0% (0)	0.0% (0)	15.8% (3)	21.1% (4)	5.3% (1)	57.9% (11)	5.05	19
Overwhelmed (anxiety, confusion)	0.0% (0)	5.3% (1)	5.3% (1)	15.8% (3)	52.6% (10)	21.1% (4)	4.79	19
Lack of Progress (Situation escalates, unable to complete assignments)	0.0% (0)	0.0% (0)	5.6% (1)	5.6% (1)	33.3% (6)	55.6% (10)	5.39	18
Strained command structure (lack of structure, unable to manage roles)	0.0% (0)	0.0% (0)	0.0% (0)	23.5% (4)	29.4% (5)	47.1% (8)	5.24	17
Communications strain/breakdown (interoperability, radio system overload)	0.0% (0)	0.0% (0)	5.6% (1)	22.2% (4)	22.2% (4)	50.0% (9)	5.17	18
Safety Compromise (loss of accountability, Mayday, Victim, Firefighter injury)	0.0% (0)	0.0% (0)	0.0% (0)	10.5% (2)	10.5% (2)	78.9% (15)	5.68	19
Insufficient resources (loss of span of control)	0.0% (0)	0.0% (0)	10.5% (2)	21.1% (4)	42.1% (8)	26.3% (5)	4.84	19
Command Inundated with information (external concerns, requests for information)	0.0% (0)	5.3% (1)	10.5% (2)	36.8% (7)	31.8% (6)	15.8% (3)	4.42	19
Unfamiliar / unexpected occurrences (odd requests, lack of similar experience, reporting volume not matching expectations, reports don't match observations, structural compromise)	0.0% (0)	0.0% (0)	10.5% (2)	42.1% (8)	26.3% (5)	21.1% (4)	4.58	19

3 of 30

Time expectations exceeded	10.5% (2)	10.5% (2)	26.3% (5)	31.6% (6)	21.1% (4)	0.0% (0)	3.42	19
Loss of responder composure (paralysis, frustration errors)	0.0% (0)	5.3% (1)	26.3% (5)	15.8% (3)	36.8% (7)	15.8% (3)	4.32	19
Sense of urgency (intuition, voice modulation)	0.0% (0)	21.1% (4)	10.5% (2)	42.1% (8)	15.8% (3)	10.5% (2)	3.84	19
Need to redeploy resources (defensive posture)	0.0% (0)	15.8% (3)	26.3% (5)	15.8% (3)	36.8% (7)	5.3% (1)	3.89	19
Multiple decision points/priorities (multiple operational site/incidents)	0.0% (0)	5.3% (1)	15.8% (3)	26.3% (5)	36.8% (7)	15.8% (3)	4.42	19
Managed by incident (reactive nature emerges, abandon SOPs or Preplans)	0.0% (0)	0.0% (0)	26.3% (5)	15.8% (3)	42.1% (8)	15.8% (3)	4.47	19
Lack of teamwork (freelancing)	0.0% (0)	0.0% (0)	5.3% (1)	26.3% (5)	47.4% (9)	21.1% (4)	4.84	19
High risk decisions (risk based analysis)	0.0% (0)	0.0% (0)	5.3% (1)	15.8% (3)	52.6% (10)	26.3% (5)	5.00	19
Complex operations/structure (need to collaborate)	0.0% (0)	0.0% (0)	26.3% (5)	36.8% (7)	31.6% (6)	5.3% (1)	4.16	19
answered question								19
skipped question								5

8. From the list above, please utilize your experience to pick the five signals that you feel are most important.



Signals and Benchmarks

	Lack of sufficient information (situational analysis)	Overwhelmed (anxiety, confusion)	Lack of Progress (Situation escalates, unable to complete assignments)	Strained command structure (lack of structure, unable to manage roles)	Communication strain/break (interoperability, radio system overload)
Most important signal	10.5% (2)	5.3% (1)	15.8% (3)	10.5% (2)	5.3% (1)
Second most important signal	21.1% (4)	5.3% (1)	0.0% (0)	5.3% (1)	15.8% (3)
Third most important signal	10.5% (2)	15.8% (3)	5.3% (1)	10.5% (2)	5.3% (1)
Fourth most important signal	0.0% (0)	0.0% (0)	15.8% (3)	15.8% (3)	5.3% (1)
Fifth most important signal	10.5% (2)	5.3% (1)	10.5% (2)	10.5% (2)	5.3% (1)

9. Given the previously identified signals that a situation is becoming unpredictable, unfamiliar or chaotic, what decision aids would enable improved confidence and capabilities in responding to that situation? Decision aids can include tools for information gathering, situational analysis, decision-making processes, etc. You can draw on best practice experience or think about the time(s) you have said "if only we had....." it would have helped us." These may be innovations that don't yet exist. Please list your response below:

	Response Count
	19
answered question	19
skipped question	5



10. Is the National Incident Management System (NIMS ICS) an optimal model for making decisions during unpredictable and unfamiliar events?

		Response Percent	Response Count
Yes		57.9%	11
No		42.1%	8

Please explain why you selected your respective answer 19

answered question	19
skipped question	5

11. Have you improvised or adapted ICS to become more effective as you have faced the challenges of responding to unique incidents?

		Response Percent	Response Count
Yes		52.6%	10
No		47.4%	9

If you answered yes, please explain and provide examples. If you answered no please indicate why 14

answered question	19
skipped question	5

Page 4, Q2. Please enter your assigned coded control number in the box below:

1	4600	Jun 30, 2012 9:54 AM
2	4400	Jun 28, 2012 2:26 PM
3	5100	Jun 28, 2012 8:26 AM
4	4900	Jun 27, 2012 1:23 PM
5	4450	Jun 27, 2012 4:40 AM
6	4350	Jun 26, 2012 11:41 AM
7	4650	Jun 26, 2012 9:02 AM
8	5350	Jun 26, 2012 8:04 AM
9	5250	Jun 26, 2012 5:21 AM
10	4250	Jun 26, 2012 4:56 AM
11	5300	Jun 25, 2012 8:04 AM
12	4800	Jun 22, 2012 7:44 AM
13	5050	Jun 19, 2012 11:25 AM
14	4770	Jun 19, 2012 6:03 AM
15	4500	Jun 18, 2012 1:46 PM
16	4300	Jun 18, 2012 12:48 PM
17	5400	Jun 18, 2012 12:18 PM
18	4100	Jun 18, 2012 6:55 AM
19	4550	Jun 16, 2012 2:41 AM
20	4850	Jun 15, 2012 3:19 PM
21	5450	Jun 15, 2012 12:55 PM

Page 5, Q3. Surge events require more resources than are readily available. When encountering surge events such as a Mass Casualty Incident (MCI) what strategies do you employ to get ahead of the event?

1	Call for help early and delegate responsibility.	Jun 30, 2012 9:59 AM
2	Perhaps the most important strategy that one can employ in the event of these types of surge events is to recognize early on that the incident is in fact one of these large scale incidents and not a normal one. As such you will not be successful if you manage (or attempt to manage it) in the same way that you would a more "routine incident. You need to recognize that the incident in all probability exceeds not only your resources and capabilities but also your previous experience base as well. In addition, it is also critically important that as the IC that you attempt to break the incident down into manageable segments and really try to get a handle on the overall magnitude of the event not just as it exists now but also how it will continue to grow/expand in the coming hours, or even days (operational periods). Carefully deploying what maybe very scarce resources during the initial stages of the incident, to where they will do the most good (and that may just be performing hazard/damage assessments to attempt to determine overall incident scope) is also important. Of course part of the initial strategy also needs to be to determine what additional resources you may need and summon them as quickly as possible realizing that it maybe hours (or longer) before they arrive.	Jun 28, 2012 2:53 PM
3	The key strategy is preplanning and having a plan in place for that event that occurs so infrequently. We often refer to it as the 3rd level of resources and having a plan in place and making sure that they are requested in a timely manner is critical to the eventual outcome of the incident.	Jun 28, 2012 8:31 AM
4	Request more resources than you think you will need. It is always easier to have the resources responding early than to not have enough and have delays due to response times. Pre-planning utilizing an all-hazards approach identifies resources and assets to better assist with immediate deployment when needed.	Jun 27, 2012 1:23 PM
5	Call for more resources than you think necessary, by the time they arrive you will probably need them, and if not you can send them home. Prepare to hit it hard, you may have once chance to get this event under control, go big or go home!	Jun 27, 2012 4:49 AM
6	mutual aid agreements accessing State resources	Jun 26, 2012 12:12 PM
7	Command at surge events oftentimes requires one to maintain constant vigilance at situational awareness and to obtain a stronghold of impending potential escalation of the incident. Without this ability it can be particularly easy to lose the focus of the overall incident and concentrate on the particulars at hand and not on the potential growth of the incident and get lost in the immediate needs of the incident and not have significant forward thinking towards needs assessment pertaining to incident escalation and all matters pertaining to same.	Jun 26, 2012 9:24 AM
8	1. Callback personnel according to SOPs 2. Request mutual aid according to SOPs 3. Request regional/state assets	Jun 26, 2012 8:08 AM
9	A key factor in the handling of a surge event, I believe, is the pre-planning for such an event. Having a plan in place to request pre-determined number of ambulance or other specialty resources with allow the incident commander to be able to focus on the development of his IAP and not have to be determining who should be called. The next best strategy I think is to make sure that key ICS/ MCI	Jun 26, 2012 6:21 AM

Page 5, Q3. Surge events require more resources than are readily available. When encountering surge events such as a Mass Casualty Incident (MCI) what strategies do you employ to get ahead of the event?

	positions are assigned and those individuals know what their role and responsibility is. If the IC has these positions filled and with competent individuals who know what their responsibility is then the IC would have a good head start on the event.	
10	Early and consistent utilization of the ICS system. Delegation of responsibilities to competent responders. Conferring with colleagues to confirm my initial impression, and ensure I'm not missing anything	Jun 26, 2012 5:06 AM
11	1. Rely on pre plans forevent/incident and or location Prioritizing resources for life safety and possible rescues	Jun 22, 2012 7:51 AM
12	Type of resources and availability of said resources are essential to handle the type of situation. In addition, time factors have to be worked out.	Jun 19, 2012 11:41 AM
13	Address immediate concerns then think rapidly about what is needed 30 minutes from now or 60 minutes from now. It will take you a lot of time to get those resources so call for them now.	Jun 19, 2012 6:07 AM
14	Initiation of the MCI Plan. Quick triage to estimate number of patients. Identify appropriate resources to respond to staging. Number of resources should be in excess of number identified to make sure sufficient resources are available. If local area resources were unavailable or over extended use the Fire Mobilization Ambulance Task Force Running Cards	Jun 18, 2012 1:51 PM
15	Various types of triage can be employed such as START Triage.	Jun 18, 2012 12:57 PM
16	Maintaining tight control over the limited resources available is key. A strong incident command is necessary to make the most of your limited initial resources. Pre-planning for surge events allows you to access additional resources in a coordinated / organized manner - allowing you focus on the situation at hand.	Jun 18, 2012 12:30 PM
17	throw more resources at it, more than may be needed.	Jun 18, 2012 6:57 AM
18	1. Expand the ICS structure for effective command and control. 2. Assign Triage Officer select priority transport and communicate with medical staff at event. 3. Set Staging Area and assign Staging Officer. 4. Assign person to communicate with C Med and track where Amb. took victims. 5. After assessment activate our local medical emergency plan for use of both fire and private Amb. 6. More Amb needed activated the Fire District Amb plan. 7. Had Operations Bring in one Amb at a time from Staging into scene to load patients so that there would not be a bottle neck which could result in a delay. 8. Assigned public information officer and designated place away from incident for press to come to for info.	Jun 16, 2012 3:37 AM
19	Prioritize objectives. Divide objectives into, stop expansion, stabilize, resolve. Identify resources in excess of what is immediately obvious. Begin thinking about the potential duration and how to sustain operations.	Jun 15, 2012 3:25 PM
20	Stay Calm. This calms everyone else down, and focus on: 1. Summoning the correct level of response based upon conditions. 2. Establishing assignments. 3. Requesting and securing Tactical Channels.	Jun 15, 2012 1:02 PM

Page 5, Q4. During large events, what regional strategies have been developed in your area to compliment the initial response?

1	Our department has established dispatch scenarios and task forces that have the necessary training and equipment. Additionally, we have a regional approach that has identical equipment and training that makes for a smooth transition.	Jun 30, 2012 9:59 AM
2	The state has a robust and very well coordinated fire and EMS mutual aid response and coordination system. In addition, most counties have either county and/or regional resources available for large scale incidents such as hazardous materials, technical rescue, mass casualty, and incident support and assistance teams, etc. In addition to the county/regional resources, statewide resources are available in these disciplines as well, including a USAR team. Due to the state's relatively small size, most resources can have at least an advance team in place within just a few hours.	Jun 28, 2012 2:53 PM
3	We have a very aggressive County Mutual Aid Center that is staffed by highly trained members who take their jobs very serious. They have all the latest running cards, area and state resources listed and also have access to the 3rd level of assistance in the Statewide Fire Mobilization Plan.	Jun 28, 2012 8:31 AM
4	We currently have a predetermined 10 Alarm response card for every community in Essex County. We also have strategically placed assets such as foam trailers, MCI response trailers, Haz-Mat response trailers, and a Regional Technical rescue Team to augment the initial response.	Jun 27, 2012 1:23 PM
5	My Metro region has a fantastic mutual and automatic aid response plan that is utilized often. Much planning has taken place before hand to cover any event with manpower and equipment as quickly as possible, which is simply a call for assistance.	Jun 27, 2012 4:49 AM
6	task force operations MEMA American Red Cross	Jun 26, 2012 12:12 PM
7	Automatic aid, closest unit responses, initial alarm assignment of multiple units and type of units merely based on call type as determined by dispatch or caller description. Likewise, subsequent unit alarm response based on canned later alarms as determined by call type. Additionally, the automatic response of chief officers for assistance with scene management, safety, and command and control of multiple jurisdictional resources.	Jun 26, 2012 9:24 AM
8	1. Mutual aid agreements 2. Regional task forces	Jun 26, 2012 8:08 AM
9	Being a town that borders two fire district and also being in a different county then my fire district there is the benefit of several options. Both counties have mutual aid response plans which would allow for the calling in of resources to compliment the incident. There is also a ambulance strike team plan that will assist in response. There are also regional plans for specialty items such as MCI trailers, Mass Decon Units, Foam Trailers, in addition to the ambulance strike teams.	Jun 26, 2012 6:21 AM
10	Mutual aid relationships include the response of Chief Officers to assist with incident management functions. This can be informal, with chiefs responding with their companies as part of the mutual aid response, up to an including more formal arrangements such as IMT teams.	Jun 26, 2012 5:06 AM

Page 5, Q4. During large events, what regional strategies have been developed in your area to compliment the initial response?

11	We have developed mutual aid plans through the Border Area Mutual Aid group (40 regional towns that cross the Mass and NH Border) Use of the Nh statewide Mutual Aid Plan that uses pre-determined strike teams and task forces for specific regions in state	Jun 22, 2012 7:51 AM
12	Regional strategies as far as resources have been worked into our response plan and additionally mutual aid policies have been set up.	Jun 19, 2012 11:41 AM
13	State Mobilization Plan. But, you already should have an "alarm card" on hand to get local resources quickly before the state plan would kick in.	Jun 19, 2012 6:07 AM
14	No identified regional plan. Once local plan is exhausted go to Statewide Fire Mobilization Plan	Jun 18, 2012 1:51 PM
15	We have both the fire district 10 run response cards and then can either employ fire district strike teams and task forces or activate the State Mobilization Plan	Jun 18, 2012 12:57 PM
16	We have utilized our normal mutual aid partners (10 alarm card) to fight both structure and forest fires. In addition we have called upon District Strike Team when our normal mutual aid has been exhausted	Jun 18, 2012 12:30 PM
17	task force response	Jun 18, 2012 6:57 AM
18	1. We have a Fire District Amb. plan which would be used as needed to add to our local plan. 2. Use the Ma Fire Mobilization Plan for Amb. taskforce.	Jun 16, 2012 3:37 AM
19	Regional mutual aid systems. Statewide fire/EMS mobilization plan. Statewide support resources EMAC/IEMAC	Jun 15, 2012 3:25 PM
20	We have line box response, as well as automatic aid responses. The line box card also lists assets so I can special call special equipment or vehicles just by having dispatch request it from County Control. We have an incident management team, and we routinely summon State Incident command vehicle, rehab vehicle and decon vehicle. Red cross is immediately notified, along with our department chaplain, who can initiate a response from regional chaplains.	Jun 15, 2012 1:02 PM

Page 5, Q5. Often during chaotic events, the first few hours of response lack the required resource capability, how do you compensate?

1	prioritize. One has to have multiple game plans in place and in your head. Thinking about what your immediate needs are as well as future capabilities dictates the actions one takes.	Jun 30, 2012 9:59 AM
2	Those first few hours of such an incident are frequently dedicated to intelligence gathering and in fact attempting to determine the actual (and potential) scope of the incident. Summoning and deploying locally available resources to assist in what may be only the most limited of holding actions is important. However, recognizing the scope and magnitude of the incident, realizing that it maybe a very long duration, campaign type of incident and not allowing the resources that you initially have available get bogged down at the task level are all important. While it may also be difficult to do initially, especially on really large scale incidents, setting up an effective IMS structure/organization and filling key roles with qualified personnel will be critical to eventually mitigating the incident successfully.	Jun 28, 2012 2:53 PM
3	It is difficult at the beginning as you try to get a grasp on the magnitude and severity of the situation. Having and utilizing trained Incident Command members and having a Unified Command is critical. This is a key to the success, using available command resources and additional staff personnel from other departments in sizing up and constantly evaluating the situation will contribute to mitigating the incident.	Jun 28, 2012 8:31 AM
4	As a Fire Officer you must prioritize the response and commit those resources and personnel to those portions of the incident that have been identified as the highest and work through the list as the personnel perform the tactics that will begin to address portions of the overall strategy. This situation can be very frustrating and in many instances you have to strategize based upon your known asset availability. If there are not enough fire suppression assets to contain a fire to the block its in move further away and establish those resources to make a united stand. The military does this with casualties in battle. They pre-determine based on strategy and resources how many will be killed and wounded and they have more than enough assets to take that situation into account.	Jun 27, 2012 1:23 PM
5	In my area that would not be typical. If resources were a problem I would deploy what I had in order to protect the most people or property possible. Sometimes we need to make hard decisions and if that means deciding that you give up three buildings to save twelve than that's what we get paid for. Much like an accident scene where the decision is to concentrate on the victim with the leg amputation and not the one who is pulseless.	Jun 27, 2012 4:49 AM
6	Not sure other than triage to ensure appropriate application of resources.	Jun 26, 2012 12:12 PM
7	Front load resources for large/potentially complex events onto the initial response. Call for additional resources at the first hint of a need for escalation, based on: call type, complexity, qty of personnel needed to complete task (s) at hand, amt of time and extent of task, and physical requirements of personnel at hand. Be prudent but utilize the thought towards resources of, better to be looking at them than waiting for them.	Jun 26, 2012 9:24 AM
8	Prioritize objectives, only deal with those that we have adequate resources for -	Jun 26, 2012 8:08 AM

Page 5, Q5. Often during chaotic events, the first few hours of response lack the required resource capability, how do you compensate?

	safety of responders and civilians being the first concern.	
9	In most cases the resources that have responded to a chaotic event are stretched thin so its in most cases the local mutual aid assistance that helps to compensate. Mutual aid Chiefs on alarms responses are a extremely important resource and can help to bring a chaotic event under control. IC's should not underestimate the need for additional command officers in these large chaotic events.	Jun 26, 2012 6:21 AM
10	Ask for lots of resources at the outset. If I need them, they'll get put to work. If I don't need them, they can either get placed in staging, or demobilized. Nevertheless, it's important to request them early, in an attempt not to have the incident escalate out of control.	Jun 26, 2012 5:06 AM
11	it is important to not get ahead of yourself by requiring on scene straff and resources to provide more than they are physically capable of providing. This can quickly deplete there stength and stamina or "waste" resources. Determining that you will "alone " for some time requires the IC to prioritize strategies and tactics reserving some resources and planning on the POSSIBLE asrmlal of additional resources.	Jun 22, 2012 7:51 AM
12	We do the best we can as to our capabilities. Early activation of outside resources is priority. Having a good game plan along with being able to adapt to changing situations and coming up with a plan "B".	Jun 19, 2012 11:41 AM
13	Get ahead of the curve by mobilizing what yuo think you will need to gain control of the incident and then relieve all those personnel who are used to gain control.	Jun 19, 2012 6:07 AM
14	You often are not able to compensate quick enough or you severely over-compensate.	Jun 18, 2012 1:51 PM
15	Try to anticipate what types of events can create potential problems for your community. In our case we have in excess of 60 train crossings a day. Should a derailment occur, we have the potential to have several hundred casualties. Have the ability to know ahead of time where the available resources are and where they are coming in from is paramount. One other important process is time checks by the dispatcher. This allows you to keep track of the actual incident time progression and brings you back into focus on whether or not you are meeting your operational goals and objectives.	Jun 18, 2012 12:57 PM
16	By developing strategies that focus on the incident priorities and then allocating the limited resources to the most pressing of the priority. One must always keep life safety, including that of the responders as the number one priority.	Jun 18, 2012 12:30 PM
17	attempt mutual aid from local departments	Jun 18, 2012 6:57 AM
18	1. Establish use of the ICS system for all department to follow. 2. Use on duty Police, DPW, Utilities, and assign them to spicific roles. 3. Open the Emergency Operation Center 4. Use Members of the LEPC with special skills. 5. Use the recall of all off duty Fire Police Dispatcher and other Town employees with needed skills. 6. Use the 10 alarm mutual aid card to bring in additional resources that can be moved in immediately.	Jun 16, 2012 3:37 AM

Page 5, Q5. Often during chaotic events, the first few hours of response lack the required resource capability, how do you compensate?

- | | | |
|----|--|----------------------|
| 19 | See #3 above, establish objectives that reduce loss that can be accomplished with what is on hand and reasonably certain of short response. | Jun 15, 2012 3:25 PM |
| 20 | I adjust the operational period according to my on scene assets and ensure they are well cared for by a safety officer team. In addition, I teach the philosophy of calling early. | Jun 15, 2012 1:02 PM |

Page 6, Q6. During large, unfamiliar events the level of information directed toward the incident commander is often overwhelming. How do you manage and filter this information flow?

- 1 I am fortunate to have an aide. His help in the command post is immeasurable and provides a synergistic relationship. Although he is not a command officer, our open lines of communication allow him to be a second set of eyes and ears in the CP. He shadows my tac sheet as a safety net that enables us to track (and not lose) all resources. Additionally, he monitors and operates other radio channels so I can focus on the tac channel. I don't have to move my attention from the scene to communications for example to call for help or make updates. Jun 30, 2012 10:06 AM
- 2 Again, I think this comes down to having an effective IMS organization structure in place, or being developed. Hopefully the personnel who answer directly to you, especially the operations chief, will filter and prioritize much of the information before it gets to the IC. It is important that these personnel also recognize the magnitude of the incident and attempt to adjust their decision making process accordingly, not get bogged down with mundane details. The IC needs to be able to eventually get to a CP where he/she can be isolated if necessary to meet with key staff and/or decision makers as the incident continues to develop or evolve and as additional resources arrive. Holding regular briefing sessions with command and staff personnel will help to filter, manage and prioritize the information as well. Jun 28, 2012 3:00 PM
- 3 By creating and operating under a formal Incident Command structure and having only key members reporting to the IC. Having assigned tasks and responsibilities makes managing the incident easier for the IC. There has to be a filter in place and that is done by funneling the information up to the top and limiting decisions and discussions that can be handled at lower levels or by other members. Jun 28, 2012 8:33 AM
- 4 I assign a Liaison to assist with the filtering of the information and keep the face to face from outside contacts to a minimum while I am developing a strategy. I also utilize a check list of bench marks and maintain a strict hierarchy within the ICS system. Delegation of info is very important during these events and those supporting the IC must be trained and trusted to utilize the info obtained and filter to the IC as well. Jun 27, 2012 1:23 PM
- 5 Assign subordinate Chief Officers as sector commanders. Assign Staff "sector" positions such as the information officer. As the incident Commander you MUST reduce the number of people reporting to you to a manageable level. It's all about incident command, span of control, unity of command, and division of labor. This may sound like a simplistic answer but it truly works. If you utilize an expanding system, and have competent people filling those key positions, you will give yourself the greatest opportunity for success. Flying by the seat of your pants is a recipe for failure. Jun 27, 2012 4:55 AM
- 6 Good incident management structure and accountability. Jun 26, 2012 12:14 PM
- 7 It is essential that all personnel utilize radio comms restraint, every dept has personnel and over talk on the radio. As mentioned in the question command is often times overwhelmed with comms, most often containing non critical nor warranted info. Personnel must be trained to follow established lines of comms both on routine calls as well as emergency calls to avoid over talking on true complex calls. This can be accomplished by consistently training in this area relative to the use of ICS and channeling comms through the appropriate Jun 26, 2012 9:31 AM

Page 6, Q6. During large, unfamiliar events the level of information directed toward the incident commander is often overwhelming. How do you manage and filter this information flow?

	group/division or branch director to allow the IC/OPS to be able to minimize the magnitude of info that he/she must directly have to deal with given the vast potential complexity and needs of the larger incident. Supervisors must also gain the incite and ability to manage their respective areas of responsibilities and personnel without the constant need for un wanted commo with the IC. The thought being if your managing at a given task/geophaphical/function level then do so, interact with command when needed or to confirm completion, needs or an emergent need, but dont continue with un warranted commo.	
8	1. Buildout ICS structure to delegate different areas of responsibility to others. 2. Write down plans and key information to keep it in front of you.	Jun 26, 2012 8:09 AM
9	I rely upon the assistance of an aid which could be a FF from my own dept, an officer from my own dept. or a mutual aid Chiefs. It is extremely import that an Ic have assistance at the command post to collect information, an allow the Ic to filter information and use what is necessary to develop the IAP to pass along to the IC command staff. It is import the the IC establish his command staff positions early on in what is a chaotic and long term incident. The use of an IMAT or a resource such as the Department of fire Services Incident support unit could assist the IC is organizing the information flow. Many times IC's do not call in these types of resources early enough, and a lot of time the incident gets way ahead of them because of there reluctance or it may be just the fact that they needed the tap on the shoulder or a call from the dispatcher to remind them or ask them if they want certain resources. Many times the prompt will get them to call for it.	Jun 26, 2012 6:30 AM
10	Pad of paper to write things down. If possible, have an aide to either serve as a scribe, or someone to nudge me and advise that a unit is calling me on the radio - if I've tuned it out due to tunnel vision.	Jun 26, 2012 5:08 AM
11	Determine what information is creditable. This means that prior to the incident knowing your staff and the other personnel that may respond to the incident (mutual aid or PD or Town employees or Government Officials) . Listen to each report independently. Listen to every report. Learn to be able to 'translate' the information provided. Determine what information is relevant to the incident and then develop an appropriate strategy. Try and determine if the information provided is similar to your expectations for this type of incident. If it is not consistent, then you must ask yourself why and try to determine what information is missing before you proceed with commands	Jun 22, 2012 7:57 AM
12	Have a good command staff and utilizing a scribe to capture all information. Life safety takes priority and is dealt with first for all decision making.	Jun 19, 2012 11:44 AM
13	Make sure you can structure a COMMANDPOST with sufficient number of aides to assist you: OPS, Safety, Rehab, Staging, PIO, Medical, Liaisons. Communications within the COMMAND structure to educate those as to the organization that is established will reduce the stress on the COMMANDER as the people in the established roles begin to filter out what information needs to get to COMMAND relative to the information that they use to gain control of the incident scene and distribute resources appropriately.	Jun 19, 2012 6:11 AM
14	By using the ICS and creating the Command Staff Positions early in the event	Jun 18, 2012 1:52 PM

Page 6, Q6. During large, unfamiliar events the level of information directed toward the incident commander is often overwhelming. How do you manage and filter this information flow?

often before the real need is realized.

- | | | |
|----|---|-----------------------|
| 15 | Quickly break the incident down. Having an operations officer directly at the heart of the situation is critical. In addition, calling in additional resources sooner than later allows for more positions within the ICS sphere to be filled thus reducing the information overload and allowing the IC to establish a tactical plan. Additionally, the need for Unified Command must be determined quickly and a command post established. If not, various agencies can start to migrate in different directions thus making the situation less manageable. | Jun 18, 2012 12:57 PM |
| 16 | I try to expand the incident command structure to the level necessary to maintain a span of control of five. This is sometimes very difficult during the initial phase of an incident. Having close working relationships with area chiefs allows for a more rapid expansion of the command structure. | Jun 18, 2012 12:34 PM |
| 17 | having more people in command breaking down parts of the admin to smaller groups or individuals | Jun 18, 2012 6:57 AM |
| 18 | Set up ICS. IC, Safety, Operations that would be broken down into manageable divisions by locations so that the info would flow from the workers to the division and then what was needed to be transferred would be sent to operations and then this person and safety could communicate with IC. Establish PIO and site away from IC so this person can communicate with Press and give info that IC has directed them to give out. questions from press | Jun 16, 2012 3:44 AM |
| 19 | Use NIMS effectively to effect span of control. Limit access to command. use self discipline to focus. Limit inputs (e.g. radios) | Jun 15, 2012 3:29 PM |
| 20 | We have an off duty dispatcher respond to the scene to manage radio traffic. I appoint a scribe as well. We encourage information between groups and divisions do not have to always go through command unless I need to know of a tactical change. | Jun 15, 2012 1:03 PM |

Page 8, Q9. Given the previously identified signals that a situation is becoming unpredictable, unfamiliar or chaotic, what decision aids would enable improved confidence and capabilities in responding to that situation? Decision aids can include tools for information gathering, situational analysis, decisi...

1	I think the best decision aide is a robust training program. Put potential and current IC's in scenario based training on a regular basis. Having experience, even simulated, will give ICs more confidence to face such situations.	Jun 30, 2012 10:15 AM
2	Additional training for all officers and command personnel in large scale incident management operations is important. To often in the fire service we have the 2 room house fire, 1 3/4" line mind set and attempt to apply those concepts or operations to every incident. They are our defacto benchmark. Having a command staff that can effectively recognize and apply modified decision making capabilities to large scale incidents is very important. However, since these incidents occur very infrequently, at most maybe once or twice in a career, the only way to prepare is through training and developing the necessary skills and confidence through practice on full scale exercises. Resouces such as aerial recon, if possible, can also be extremely effective. The Tampa Florida PD puts a helicopter in the air that streams live video (and is available for other uses by the IC) to the IC on any 2nd alarm or greater fire.	Jun 28, 2012 3:17 PM
3	Utilization of benchmark check sheets and computerization of many safety aspects of the incident. GIS is a great tool to utilize for large scale situations and evacuations.	Jun 27, 2012 1:23 PM
4	Current preplans and facility premise information. Appropriate manning and level of competence.	Jun 27, 2012 5:10 AM
5	The only thing I can think of would be to ensure the availability of other emergency managers with more experience and training to advise and assist.	Jun 26, 2012 12:32 PM
6	From the onset, have someone of credible trust, provide for a true and complete size up, begin to provide direction for appropriate assignments, establish command, and ensure that all commo goes through the IC to dispatch. establish group/div supts to manage and control tasks provided within areas of the scene, establish and maintain ICS and absolute iron clad accountability. Any time the posture of call changes, eg, offensive to defensive request par levels, along with any time command is advised of a safety confirm.	Jun 26, 2012 9:44 AM
7	Tough to answer - usually what we need is more line resources to complete tasks, and more command personnel to share the work load of analyzing information and making plans. Along with that we need information.	Jun 26, 2012 8:22 AM
8	On site internet access to pre-plans Inter-net access to resource availability an IMAT team early on in the incident Electronic accountability of personnel.	Jun 26, 2012 6:58 AM
9	IMT Additional Chief Officers to monitor big picture, and alert IC of conditions which may be missed due to attention to smaller details.	Jun 26, 2012 5:15 AM
10	Increased and more accurate information from within and around the incident. With information an experienced command staff or IC can make informed decisions. Thus better audio, video or any additional data relative to the scene. For example are the interior temperatures increasing or decreasing, are FFs physically and medically maintaining so that they can continue without relief and rehab.	Jun 22, 2012 8:12 AM

Page 8, Q9. Given the previously identified signals that a situation is becoming unpredictable, unfamiliar or chaotic, what decision aids would enable improved confidence and capabilities in responding to that situation? Decision aids can include tools for information gathering, situational analysis, decisi...

11	Training is the most valuable tool that we have. Having a plan along with good SOG's will make dealing with uncomfortable situations easier.	Jun 19, 2012 11:59 AM
12	Having a senior very experienced chief officer on scene (via technology...i.e., video conferencing) to give his analysis and recommendations	Jun 19, 2012 7:25 AM
13	Having a trusted and trained command staff that is supplying sufficient information to make reliable decisions. Many smaller communities do not have the operational command staff to run a large operation. A ready response of an incident support management team would be a great help.	Jun 18, 2012 2:02 PM
14	I personally respond best to visual cues, so it is important for me to have visual inputs when making decisions. I recently handled a haz-mat incident and was having some difficulties with the operational plan. I was able to have an engine company deploy a thermal imager with transmit capabilities and once the receiver (TV) was set-up we were able to view all of the operations in real time and the command post which was established as a Unified Command was able to make better decisions and expedite the safe mitigation of the incident.	Jun 18, 2012 1:12 PM
15	Adequate command staff, Incident Management Team	Jun 18, 2012 12:44 PM
16	predetermined response and response practice	Jun 18, 2012 7:06 AM
17	Establish the ICS components quickly to prevent overload. Bring in help sooner rather than later.	Jun 16, 2012 4:07 AM
18	Better real-time incident mapping to give a virtual bird's eye view on a large flat panel like the "windows" table" that are in some hotel lobbies	Jun 15, 2012 3:39 PM
19	Better accountability. We are in the stone age. We should have technology on our side and we do not. We need to automate our responses so that the closest asset regardless of jurisdictional boundaries responds; lose the egos. Use technology of modern dispatch to do their jobs.	Jun 15, 2012 1:12 PM

Page 8, Q10. Is the National Incident Management System (NIMS ICS) an optimal model for making decisions during unpredictable and unfamiliar events?

1	NIMS is not a decision model but an organizational tool. I still use my frames of reference for decisions and go on instinct in unfamiliar situations.	Jun 30, 2012 10:15 AM
2	Its unlimited expandability and the availability of regional, state and even federal overhead teams to assist, or even take over incident management make it appropriate for even the largest of incidents. In addition it allows for the inclusion of subject matter experts to assist and/or advise key decision makers.	Jun 28, 2012 3:17 PM
3	The NIMS System is a great foundational guide but i do not think that it can be utilized in some situations that become too big too quickly.	Jun 27, 2012 1:23 PM
4	While I do believe in this model, and would have said YES I choose no only because I feel we are often expected to blindly follow this system without regard to individual circumstances. I would prefer to say I follow a "modified" NIMS ICS system, one in which the heart and soul are there, but things have been tweaked for my particular department's needs.	Jun 27, 2012 5:10 AM
5	It is the model with which I am most familiar.	Jun 26, 2012 12:32 PM
6	Although amendments are no doubt made at local levels the IMS system provides for an organized and systematic method of establishing the channelling of information intel and provides for a uniform method of getting that info out.	Jun 26, 2012 9:44 AM
7	It gives us a tool to use AND everyone should be familiar with the same tool. It is not a one-size fit all however as some would teach it - it has to be adapted to work with each agencies make-up.	Jun 26, 2012 8:22 AM
8	I think the NIMS-ICS provides for the structure for command level positions. The NIMS-ICS does not directly provide for aiding in making on scene decision. It prompts the IC that they should be developing an IAP and have a command structure in place, but I think it's more of experience, training, and education that leads toward making good decisions during an unpredictable event.	Jun 26, 2012 6:58 AM
9	It's scalable and designed to build on the day-to-day operations.	Jun 26, 2012 5:15 AM
10	In short, the control of an incident. When resources are directed to a geographic or specific tactic without detailed explanations, when mutual aid resources understand the ICS then a high degree of stress is relieved from the IC thus allowing the IC to concentrate on the strategies.	Jun 22, 2012 8:12 AM
11	The NIMS ICS gives us a proper framework to handle all situations big and small.	Jun 19, 2012 11:59 AM
12	NIMS is most useful in larger metropolitan settings where resources can quickly be gathered. In smaller communities it may not be possible for resources to assemble quick enough for COMMAND to establish an appropriate structure to deal with the chaotic situation.	Jun 19, 2012 7:25 AM
13	I think the NIMS ICS is a fantastic resource when you have the staff to implement like the Federal Agencies. It does have its benefits though. It is a standard model that is used across the country and is known to many first responders. It could be better.	Jun 18, 2012 2:02 PM

Page 8, Q10. Is the National Incident Management System (NIMS ICS) an optimal model for making decisions during unpredictable and unfamiliar events?

14	Not in my opinion. I prefer to utilized the ICS system that we have developed since it is easy to deploy. NIMS in my opinion is not as flexible and is not as readily used, so the familiarity of the system my create strains on an incident.	Jun 18, 2012 1:12 PM
15	If properly expanded the ICS should be able to support any event.	Jun 18, 2012 12:44 PM
16	it helps top break incident into smaller pieces	Jun 18, 2012 7:06 AM
17	Use of the ICS system at every event is important. The use of this system at larger and unpredictable events is needed in order to have proper control and good flow of info from the bottom to top and reversed.	Jun 16, 2012 4:07 AM
18	It addresses key factors of organization and human limitations. Other models may be imaginable, but are not likely to be truly more effective.	Jun 15, 2012 3:39 PM
19	It predetermines the point at which you know you must expand the organization. There is nothing that kicks you to remind you per se, but if you follow the principles of span of control and common sense, the ICS system being followed works well.	Jun 15, 2012 1:12 PM

Page 8, Q11. Have you improvised or adapted ICS to become more effective as you have faced the challenges of responding to unique incidents?

1	I have always followed the ICS and make my situation fit. It is a good tool to organize resources.	Jun 30, 2012 10:15 AM
2	In the typical ICS the first responding officer is command until relieved by a senior officer. I developed a system where the first arriving officer gives a brief report to the responding Chief Officer. That chief Officer determines if the situation needs immediate command. If so, he assigns Command to the senior officer on scene or who will be arriving shortly. If immediate command is not necessary he allows the on scene officer to go to work (ie, investigating) and assumes command once on scene.	Jun 27, 2012 5:10 AM
3	See above	Jun 26, 2012 9:44 AM
4	As noted above although ICS is designed to be built-out as a situation unfolds it still has to be adapted to each agencies make-up. A large city department responding to a given incident will deploy resources and build out their ICS differently then a small volunteer department responding to the same incident.	Jun 26, 2012 8:22 AM
5	Not sure if I have never done this but in most cases there has been some form of command structure.	Jun 26, 2012 6:58 AM
6	It works pretty well, didn't see the need to adapt it. We've been using it for over a dozen years, and it does help manage the incident.	Jun 26, 2012 5:15 AM
7	The systems works as you see fit. It adapts itself to your specific need.	Jun 19, 2012 11:59 AM
8	An MCI may require a "Medical Officer" before an OPS chief is established, for example.	Jun 19, 2012 7:25 AM
9	have had to have people assume multiple roles when there should have been individuals in each role	Jun 18, 2012 2:02 PM
10	ICS is a tool which is created to expand and contract as needed. We modify it every day to meet the challenges associated with various incidents. For example, we have addition investigative teams to work with fire investigation, we have, modified it for use with our dive rescue team, we have utilized it during technical rescue operations, etc. If used properly, ICS can be a valuable asset to any operation.	Jun 18, 2012 1:12 PM
11	somewhat! it can grow with the incident but if you are working with police that dont use it than you need to walk through it slower getting then involved in it	Jun 18, 2012 7:06 AM
12	When you have the need for specilized people this system allows for them to get the task required by IC and they are able to handle all the Tech. aspects required to preform it without interfeearance for any one.	Jun 16, 2012 4:07 AM
13	That's cheating as to do so would clearly identify me...	Jun 15, 2012 3:39 PM
14	Specific examples are establishing unfamiliar groups during a plane crash. We had a natural resource group the developed a synopsis of the land conditions for a search. We have used an "environmental Group", that ensure toxins were monitored before going in to waterways.	Jun 15, 2012 1:12 PM

1. I agree to participate in this study. I understand that by agreeing to participate and clicking "yes" I do not waive any of my legal rights.

		Response Percent	Response Count
Yes	<div><div></div></div>	100.0%	19
No		0.0%	0
answered question			19
skipped question			2

2. Please enter your assigned coded control number in the box below:

		Response Average	Response Total	Response Count
Assigned Coded Control Number		4,962.86	104,220	21
answered question				21
skipped question				0

3. The second round survey asked you to identify strategies to get ahead of a surge event. The most frequent response to this question was to employ preplanning and rapidly activate mutual aid plans. To provide you with some additional context, I have listed two examples of responses that focused on this issue. “The key strategy is preplanning and having a plan in place for the event that occurs so infrequently. We often refer to it as the 3rd level of resources and having a plan in place and making sure that it is activated in a timely manner is critical to the eventual outcome of the incident.” “Preplanning for surge events allows you to access additional resources in a coordinated and organized manner – this allows you to focus on the situation at hand.” Reflecting on the information above, what could make the existing 2nd (regional) and 3rd (state) tier mutual aid plans more effective?

	Response Count
	21
answered question	21
skipped question	0

4. Please rate the frequency that you have utilized the strategies listed below: If you answer never you can also check the box on the far right if you would consider adopting this approach in the future.

	Never	Seldom	Sometimes	At All Significant Incidents	If you answered never, check this box if you would consider adopting this approach in the future	Response Count
Assign a Liaison Officer	19.0% (4)	33.3% (7)	19.0% (4)	28.6% (6)	19.0% (4)	21
Assign a Safety Officer	0.0% (0)	4.8% (1)	9.5% (2)	85.7% (18)	0.0% (0)	21
Develop a Unified Command Structure	0.0% (0)	4.8% (1)	38.1% (8)	57.1% (12)	0.0% (0)	21
Utilize Command Staff or additional Chief Officers from the local area	5.0% (1)	0.0% (0)	30.0% (6)	65.0% (13)	5.0% (1)	20
Appoint a Deputy Incident Commander	33.3% (7)	33.3% (7)	9.5% (2)	19.0% (4)	23.8% (5)	21
Appoint a Deputy Operations Officer	33.3% (7)	19.0% (4)	23.8% (5)	19.0% (4)	28.6% (6)	21
Assign personnel to the Logistics Section	15.8% (3)	26.3% (5)	26.3% (5)	31.6% (6)	15.8% (3)	19
Assign personnel to the Planning Section	28.6% (6)	23.8% (5)	23.8% (5)	23.8% (5)	14.3% (3)	21
Assign personnel to the Finance Section	38.1% (8)	28.6% (6)	19.0% (4)	14.3% (3)	14.3% (3)	21
Request more resources than the initial assessment indicates	0.0% (0)	28.6% (6)	42.9% (9)	28.6% (6)	0.0% (0)	21
Break the incident into manageable segments	4.8% (1)	4.8% (1)	33.1% (8)	52.4% (11)	4.8% (1)	21
Constantly seek updated situational awareness	0.0% (0)	4.8% (1)	9.5% (2)	85.7% (18)	0.0% (0)	21

3 of 22

Confer with experienced colleagues that are not on the incident scene	19.0% (4)	23.8% (5)	38.1% (8)	19.0% (4)	14.3% (3)	21
Construct options (multiple game plans)	4.8% (1)	28.6% (6)	47.6% (10)	19.0% (4)	0.0% (0)	21
Integrate non-governmental personnel (e.g. local experts, private sector resources)	5.0% (1)	45.0% (9)	30.0% (6)	20.0% (4)	0.0% (0)	20
Adjust the length of operational periods	14.3% (3)	33.3% (7)	38.1% (8)	14.3% (3)	4.8% (1)	21
Automate notification of elapsed time through your dispatch center	28.6% (6)	19.0% (4)	14.3% (3)	38.1% (8)	23.8% (5)	21
answered question						21
skipped question						0

5. Other than the use of mutual aid plans, the second round Delphi survey suggested that one of the next most important capabilities is the informal response of area Chief Officers. The following quotes are taken from round two survey responses. "The automatic response of area Chief Officers provide assistance with scene management, safety, and the control of resources from multiple jurisdictions." "Mutual aid relationships include the response of Chief Officers to assist with incident management functions. This can be informal, with chiefs responding with their companies as part of the mutual aid response." How could the value of the informal response of area Chief Officers detailed above be strengthened?

Response Count						21
answered question						21
skipped question						0

6. Please indicate how frequently you utilize each of the following methodologies to assist you in the management of surge incidents. If you answer never you can also check the box on the far right if you would consider adopting this approach in the future.

	Never	Seldom	Sometimes	At All Significant Incidents	If you answered never check this box if you would you consider adopting this approach in the future.	Response Count
Expand ICS Structure, delegate responsibilities, empower personnel	0.0% (0)	9.5% (2)	9.5% (2)	81.0% (17)	0.0% (0)	21
Utilize an aide	4.8% (1)	14.3% (3)	38.1% (8)	42.9% (9)	0.0% (0)	21
Assign a liaison	0.0% (0)	42.9% (9)	23.8% (5)	28.6% (6)	4.8% (1)	21
Assign a scribe	9.5% (2)	38.1% (8)	28.6% (6)	23.8% (5)	9.5% (2)	21
Assign a communications specialist	23.8% (5)	33.3% (7)	14.3% (3)	28.6% (6)	14.3% (3)	21
Write down plans, complete checklists	4.8% (1)	23.8% (5)	33.3% (7)	38.1% (8)	4.8% (1)	21
Break the incident into manageable segments	0.0% (0)	14.3% (3)	42.9% (9)	42.9% (9)	0.0% (0)	21
Encourage the relationship based response of local chief officers – informal support	9.5% (2)	9.5% (2)	33.3% (7)	47.6% (10)	4.8% (1)	21
Implement security at the command post	42.9% (9)	14.3% (3)	23.8% (5)	19.0% (4)	33.3% (7)	21
Move the command post away from the incident scene	9.5% (2)	28.6% (6)	47.6% (10)	14.3% (3)	4.8% (1)	21
Conduct regular internal briefing sessions	0.0% (0)	14.3% (3)	42.9% (9)	42.9% (9)	0.0% (0)	21
Limit radio traffic to critical communication	9.5% (2)	23.8% (5)	33.3% (7)	33.3% (7)	4.8% (1)	21

Verify the credibility of information	9.5% (2)	14.3% (3)	38.1% (8)	38.1% (8)	9.5% (2)	21
Assign a Public Information Officer (PIO)	0.0% (0)	14.3% (3)	42.9% (9)	42.9% (9)	0.0% (0)	21
Conduct press briefings away from the command post	9.5% (2)	9.5% (2)	38.1% (8)	42.9% (9)	4.8% (1)	21
answered question						21
skipped question						0

7. Round two generated many good ideas on decision aides and I would like your feedback on some of these concepts. If you were recommending investment in each of these decision aids listed below, what priority would you give each of the eight concepts listed below? Please select no more than three items for each category.

	Low Priority	Middle Priority	Top Priority	Rating Average	Response Count
Video based aerial reconnaissance (drone, helicopter)	70.0% (14)	25.0% (5)	5.0% (1)	1.35	20
Enhanced accountability systems that indicate personnel position and elevation using sensors	20.0% (4)	15.0% (3)	65.0% (13)	2.45	20
Automatic Incident Management Team (IMT) response	0.0% (0)	38.1% (8)	61.9% (13)	2.62	21
Training programs and exercises	0.0% (0)	23.8% (5)	76.2% (16)	2.76	21
Video conferencing capability with experienced personnel or subject matter experts	45.0% (9)	40.0% (8)	15.0% (3)	1.70	20
Sensor based interior monitoring of temperature, thermal imagery	25.0% (5)	55.0% (11)	20.0% (4)	1.95	20
Computerized checklists and preplan data	9.5% (2)	28.6% (6)	61.9% (13)	2.52	21
Internet access on the incident scene	15.0% (3)	50.0% (10)	35.0% (7)	2.20	20
answered question					21
skipped question					0

8. Please list any other ideas that you have for decision aids that are useful during the response to surge events.

Response Count	
9	
answered question	9
skipped question	12

9. During the second round Delphi survey, approximately 45% of respondents indicated that the National Incident Management System (NIMS) is not an optimal model for making decisions during unpredictable and unfamiliar events. A review of the German Regulation DV 100 (the German equivalent to NIMS) identified several potential concepts. Would you support modifying NIMS with these practices?

	Yes	No	Rating Average	Response Count
Develop partnerships with non traditional organizations such as private corporations or clubs	76.2% (16)	23.8% (5)	1.00	21
Develop a communications and transmission staff function	95.0% (19)	5.0% (1)	1.00	20
Develop a personnel and administration staff function	85.0% (17)	15.0% (3)	1.00	20
Develop an information gathering and assessment staff function	95.2% (20)	4.8% (1)	1.00	21
Develop computer based command checklists	81.0% (17)	19.0% (4)	1.00	21
Move the command post to a fixed off site facility	38.1% (8)	61.9% (13)	1.00	21
Provide less structure and allow more creativity	20.0% (4)	80.0% (16)	1.00	20
Automated response of incident support teams	85.7% (18)	14.3% (3)	1.00	21
Development of situational analysis teams (dedicated personnel that focus on gathering and verifying information for the incident commander)	100.0% (21)	0.0% (0)	1.00	21
Development of regional support teams	100.0% (21)	0.0% (0)	1.00	21
answered question				21
skipped question				0

10. As a reminder, surge events are defined as emergency incidents that that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving exponential fire spread; natural disasters and terrorism related events. These surge events are rare and of such a magnitude that the incident commander is confronted with a unique situation that often exceeds his/her experience and ability to improvise and adapt to changing conditions. What creative or innovative ideas do you have to enhance the ability to cope with these unfamiliar situations?

Response
Count

16

answered question

16

skipped question

5

Page 4, Q2. Please enter your assigned coded control number in the box below:

1	5500	Aug 12, 2012 6:02 PM
2	4100	Aug 12, 2012 6:00 PM
3	4650	Aug 12, 2012 5:58 PM
4	5050	Aug 12, 2012 5:56 PM
5	4600	Aug 12, 2012 5:54 PM
6	4350	Aug 2, 2012 1:12 PM
7	5000	Aug 1, 2012 5:04 AM
8	5350	Jul 31, 2012 3:08 PM
9	5300	Jul 30, 2012 10:37 AM
10	5450	Jul 30, 2012 9:55 AM
11	5100	Jul 30, 2012 8:26 AM
12	4450	Jul 30, 2012 6:03 AM
13	4800	Jul 30, 2012 5:45 AM
14	5600	Jul 29, 2012 5:14 PM
15	5150	Jul 29, 2012 9:28 AM
16	4300	Jul 27, 2012 6:50 AM
17	4250	Jul 26, 2012 10:28 AM
18	4500	Jul 23, 2012 12:57 PM
19	4550	Jul 23, 2012 10:16 AM
20	7400	Jul 23, 2012 6:53 AM
21	4770	Jul 23, 2012 5:41 AM

Page 5, Q3. The second round survey asked you to identify strategies to get ahead of a surge event. The most frequent response to this question was to employ preplanning and rapidly activate mutual aid plans. To provide you with some additional context, I have listed two examples of responses that focused ...

- 1 In the surge events that I have participated in-especially the known or anticipated surge events-preplanning and reviewing the available mutual aid (2nd Tier) is very beneficial. A strong point for consideration is however;that during most surge events-NORMAL mutual aid is almost always tied up with the surge event in their community as well. This is where the 3rd Tier of (state/federal) Mutual aid needs to be considered. In the Hurricane Irene surge event-most of my normal mutual aid (based on the radio traffic I was hearing in my Command vehicle) was consumed by responses required within their own community. At least initially. I personally DID NOT call for mutual aid because the remainder of my county was out on calls dealing with the same surge event calls. This would have been a GREAT place for the state level of mutual aid coordination to come into play. Find out how the remaining departments in state were handling the Surge and know where help could come from. Ironically-the WebEOC crashed in the middle of the hurricane-thus not allowing our EMD to know what the rest of the state looked like. Aug 12, 2012 6:02 PM
- 2 table top practice in all countys. This will give departments a better understanding of the process as it does not happen enough to be profeciant Aug 12, 2012 6:00 PM
- 3 Development of automatic predetermined levels of tiered repsonses for given call types and events, thus avoiding IC overload during the most critical and stressfull of times, ie, during the height of the incident; escalation. By having pre-determined level of subsequent greater alarm responses, the IC can merely request the add'l alarm and know the type, and qty of resources being summorned. This can also play a critical role in the broader request for regional or statewide request for resources for municipal, regional or statewide needs. This would encompass pre-determined activations of task forces, strikes teams etc. Aug 12, 2012 5:58 PM
- 4 Training at the community level about the resources that are available and the way the system works. Aug 12, 2012 5:56 PM
- 5 An understanding of who has what resources. Use of existing written plans that are well exercised with partners increases effectiveness too. Aug 12, 2012 5:54 PM
- 6 Periodic review of preplan for different events by all involved. Realistic drills and training with all entities identified in preplan. Ensure adequate and compatible radio communications capability. Aug 2, 2012 1:19 PM
- 7 On-going and continual interagency training Aug 1, 2012 5:06 AM
- 8 Having them listed on your department's run card so they are readily available to both ICs and dispatchers. This should include necessary contact information for requests. Jul 31, 2012 3:11 PM
- 9 Seeing that these surge events occur so infrequently, table top training is a necessity in preparing for the actual real life event that may happen. Jul 30, 2012 10:37 AM
- 10 In order for 2nd and 3rd tier plans to be more effective, there needs to be a plan in place at the local level training plan to review them periodically and just as important, identifying means to activate plans, such as computer aided dispatch Jul 30, 2012 9:58 AM

Page 5, Q3. The second round survey asked you to identify strategies to get ahead of a surge event. The most frequent response to this question was to employ preplanning and rapidly activate mutual aid plans. To provide you with some additional context, I have listed two examples of responses that focused ...

	cues or paper resources with updated contact information.	
11	Better communications and also a condensed system where the 3rd level is managed by a highly trained and dedicated communicators that handle these events more often. The problem is the infrequency of events and the turn over in dispatch centers make it difficult to be proficient. This is true with the 2nd level of dispatch as well but not quite as complicated.	Jul 30, 2012 9:16 AM
12	I find that these plans, while great on paper, are not utilized often and therefore we are not afforded the opportunity to find the flaws. We need to either train in the use of these plans more often, or ease the rules in which we put these plans in place and use our regional resources more often. As an example, if an incident occurs at one end of my community why do we send companies from across the city when the neighboring community has two companies closer to the incident? We should cross community boundaries more often when it would benefit the citizen.	Jul 30, 2012 6:10 AM
13	Effectiveness of mutual aid plans is defined by the awareness of the plan and familiarity with the plan. This is accomplished by having those persons responsible for implementing such plans being involved in their formation and development. This creates "buy-in" for all responders. Secondly, training on the plan is crucial. All plans look great on paper. Exercising them prior to the need to use them during an incident breeds a comfort level and understanding of the plan. Lastly, every opportunity an agency gets to have its staff meet and train with other agencies builds a comfort level that will extend to the actual incident when and if it occurs.	Jul 30, 2012 5:56 AM
14	Plans are valuable but exercising the plans would identify the strengths of the plan and areas for improvement. The exercise could range from table top of representatives from each agency or full scale exercise.	Jul 29, 2012 5:19 PM
15	If all participants get involved with a table top exercise, going over the plans in a more realistic approach, drill with the other agencies as frequent as possible so that all are on the same preplan. This will allow all agencies to know each agencies expertise and equipment and actual time frame when the incoming response will get to the incident.	Jul 29, 2012 9:33 AM
16	One of the major problems with the infrequency of the major event is that we do not practice very often for them. As a result when that event should occur we have problems insuring that the proper resources are being deployed and the simple things like contact numbers are correct. So practicing and reviewing plans on a regular basis is very important. From state perspective one issue that has cropped up is there are competing entities trying to do the same job. You have the state mobilization plan which includes an EMS component and you have the EMS regions which have a plan. These plans don't compliment each other and in fact can create significant issues if they are both activated since they both draw from the same resources although the resources may be requested at different times.	Jul 27, 2012 6:58 AM
17	Exercising the 2nd and 3rd tier mutual aid plans more effective. It's also important to include mid- and lower-level officers in the exercises. A lot of times,	Jul 26, 2012 10:30 AM

Page 5, Q3. The second round survey asked you to identify strategies to get ahead of a surge event. The most frequent response to this question was to employ preplanning and rapidly activate mutual aid plans. To provide you with some additional context, I have listed two examples of responses that focused ...

	it's the Chief or Deputy who go to the exercise, however, when things happen it's the shift supervisor who is in charge at the outset, and needs to have a working understanding of the resources available as the incident rapidly escalates.	
18	Review and update of the plan. Many organizations, who are resources of a plane, change capabilities. The plan must be updated to reflect the changes. The plan(s) must "live". The second step is education of the plan to both the users and the resources of the plan.	Jul 23, 2012 1:01 PM
19	The Plans at the regional district level need to be reviewed on an semi annual basis. There needs to be a representative assigned from each department to the sub committee that is formed at the district level and all should meet and updated info and response capabilities. This should be done by formal meeting rather than survey that is sent around each year. At the State level there needs to be a representative from each fire district that is assigned to the committee for State Wide Response. they need to meet every 4 months so that the state wide plan can be updated with the changes of resources that happen at the Fire District level.	Jul 23, 2012 10:25 AM
20	The existing plans could be made much more robust and effective if there was additional training and exercises that utilized the plans in place. these exercises and training sessions could be used to modify the existing plan if needed and get the personnel involved more comfortable with the specifics of the plan and more importantly get people to be able to place a name with a face if needed if the plan is used in the future.	Jul 23, 2012 6:57 AM
21	COMMANDERS being thoroughly familiar with these Plans operations and content. And, practicing the Plans annually at least.	Jul 23, 2012 5:43 AM

Page 7, Q5. Other than the use of mutual aid plans, the second round Delphi survey suggested that one of the next most important capabilities is the informal response of area Chief Officers. The following quotes are taken from round two survey responses.

"The automatic response of area Chief Officers pro...

1	The informal response of Chief Officers could be strengthened by defining the expectations of that Chief Officer either before the event or upon immediately arriving. The problem I have experienced with this-is most chief officers are perfect for Command and Operations. When the assignment is Planning, Logistics or Finance, the strength and confidence in fulfilling that role is not as prevalent. Anyone associated with an IMAT type team-has that training and I have called for an IMAT response at most of the Surge events within my community. In my department we carry field guides and the ICS 200 series forms to assist our chief officers with filling other roles.	Aug 12, 2012 6:02 PM
2	Having prearranged agreements and dispatch that will call them. Also drilling would help	Aug 12, 2012 6:00 PM
3	The addition of outside agency Chief officers may provide added expertise, situational awareness, provided liaison functions with that dept's personnel, allow for first hand knowledge of personnel and equipment capability being provided from the responding agency. The utilization of mutual aid chiefs can become a critical facet of scene management and overall safety and resource allocation, task management of given resources on site.	Aug 12, 2012 5:59 PM
4	The response of local mutual aid Chief Officers worked well in the past with moderate incidents. For major incidents where you would go past those local boundaries, having it in the plan is essential.	Aug 12, 2012 5:57 PM
5	Building a personal relationship with colleagues would go a long way to strengthening the relationship.	Aug 12, 2012 5:54 PM
6	By identifying Departments interested in utilizing area Chief Officers at events, and identifying Chief Officers who would be willing and able to respond to these events with or without company response.	Aug 2, 2012 1:28 PM
7	Provide shadowing opportunities with other larger agencies, formalize plans or activations, create position specific personnel with alternates	Aug 1, 2012 5:10 AM
8	Move to a more structured Incident Management Team approach.	Jul 31, 2012 3:14 PM
9	Chiefs responding to mutual aid incidents should attempt to work with their own staff after receiving orders from the IC, rather than working with other firefighters on the scene that a particular chief is not familiar with.	Jul 30, 2012 10:37 AM
10	To strengthen their response, it needs to be added to the line box or automatic aid response. In addition, unified incident command SOG's as well as Safety, RIT and Rehab SOG's. Also, training for chiefs in specific incident management functions so they are accustomed to being in these roles.	Jul 30, 2012 10:02 AM
11	Make it part of a formal process. Have automatic response from Chief Officers and have them listed on the running cards as resources.	Jul 30, 2012 9:30 AM
12	More utilization of them on the scene. Prior planning with those chiefs as to what duties they would be asked to perform.	Jul 30, 2012 6:15 AM

Page 7, Q5. Other than the use of mutual aid plans, the second round Delphi survey suggested that one of the next most important capabilities is the informal response of area Chief Officers. The following quotes are taken from round two survey responses.

"The automatic response of area Chief Officers pro...

13	In developing dispatch response requirements, run cards. (levels of alarms or by types of incidents) including command staff as part of the additional resources required should be considered. Due to the fact that not every Fire Department or Agency can always be relied upon to respond due to their call volume and/or availability alternative Chief Officer from other Departments could be included. The roles and functions of these responding Chief Officers should not necessarily be pre-determined but could be utilized as needed depending on the incident.	Jul 30, 2012 6:06 AM
14	Make this a formal specific levels of response that has multiple layers to fill the command roles with experienced personnel.	Jul 29, 2012 5:45 PM
15	In our town we have this agreement between the chief officers, we utilize this through out mutual aid system. It is very important to have a chief officer from another area to come an assist, this is done automatic in our area. so little incidents we need to get as much knowledge and experience as we can, it works very well and is very valuable to our process in large scale incidents.	Jul 29, 2012 9:42 AM
16	Have it codified with the respective fire districts. In this regard the system is then recognized by all personnel and the arrival of the "Support Chiefs" is not seen as unusual or questioned by line personnel during an incident.	Jul 27, 2012 7:02 AM
17	Involving Chief Officers from neighboring communities in planning meetings before the incident - so that they're more familiar with our resources.	Jul 26, 2012 10:35 AM
18	I believe the informal response should become more formal. It is very "thin" at the top and I have seen multiple Chief Officers be transported to a hospital leaving nobody in charge! I believe that communities should have additional Chiefs respond on incidents to augment and support command roles.	Jul 23, 2012 1:06 PM
19	In the regional mutual aid plan there should be a builtin call for chief officers as additional alarms are sounded. By doing this you would have the immediate response of chief officers based on the number of alarms and apparatus that are called. This would allow for much better management of these additional resources as they arrive.	Jul 23, 2012 10:36 AM
20	Formalization of the current informal response would certainly strengthen the situation. If you can rely on additional Chief Officers to respond to your scene it will not only strengthen the overall management of the incident but free up those within the organization that is experiencing the incident to perform other functions. During the "out of the norm" situation many personnel assigned to specific functions may not appropriately trained to assume that role. Most Chief Officers should already be trained to assume many of these roles and if they are not maybe some additional regional training sessions should be offered.	Jul 23, 2012 7:03 AM
21	First of all, make the response formal - not informal. Then you can count on the arrival of Chiefs you know and are comfortable working with. Secondly, train together. Thirdly, formalize the relationships by structuring IMTs	Jul 23, 2012 5:47 AM

Page 9, Q8. Please list any other ideas that you have for decision aids that are useful during the response to surge events.

1	ICS Forms Field Operations Guide-ICS 420-1	Aug 12, 2012 6:02 PM
2	there is a concern for high tech not working because of infrequent use	Aug 12, 2012 6:01 PM
3	Greater decisions aides should be embedded into the organizational culture such as 1- SOG's that govern the need of pre-fire planning based on construction type, occupancy hazard type, safety concerns to either FF, or public 2- Hard fast ICS, IMT, and FF accountability 3- Pre determined resource responses based on alarm/call type to provide for known level of responses for most types of calls being generated.	Aug 12, 2012 5:59 PM
4	We have a fire liaison at communications who can look at the GPS layers and advise of hydrants out of service or other dynamic issues.	Aug 12, 2012 5:55 PM
5	Access to area experts. ie: if a flood situation exists I might want to speak with a dam engineer	Jul 30, 2012 6:27 AM
6	IMT is such a valuable resource, networking list of other professionals as well as other chief officers. Table Top exercises that are in real time, practice often in real time and real evolution.	Jul 29, 2012 9:51 AM
7	Pocket guides are also helpful. With a prolonged incident, you don't need to worry about running out of battery power on a handheld device if you have the info in a printed pocket guide as backup!	Jul 26, 2012 10:38 AM
8	When operating with in properties owned and controled by different agencies controled by different levels of Government it is crdical to have a one of you people assigned to there EOC . and one of there persons assigned to the command center, so you know what they are doing and plan to do before it happens.	Jul 23, 2012 10:52 AM
9	Strengthen rehab for crews, such as the extensive rehab area that was established for the Worcester MA collapse and death of 6 FFs in 1999.	Jul 23, 2012 5:53 AM

Page 11, Q10. As a reminder, surge events are defined as emergency incidents that that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving ex...

- | | | |
|---|---|-----------------------|
| 1 | Honest truth-I grab a member of my department to be a Chief Aide and direct my deputy to do the same. I have found while responding to surge events, there are simply not enough of the IC to go around especially with documentation. An Aide is invaluable for answering one of the three cell phones ringing, radio traffic, driving, and it just goes on and on. The person picked for Aide must be willing to tackle the tasks at hand. | Aug 12, 2012 6:02 PM |
| 2 | Requests addl resources early. stage secondary tiers of subsequent alarms within incident reach but not in immediate area. Set up large enough rehab area to accomodate the volume of personnel potentially expected to participate in the incident, consider the use of on site dispatch functions for these larger surge events, ie, do not over load dispatch via radio, have field response of disptach personnel which can operate from the scene from within a "Mobile Dispatch Center" remotely from the scene. Accomplishing this diminishes the radio traffic on dispatch and allows for near normal operations at the dispatch center, while providing for quick actions by trained dispatchers. | Aug 12, 2012 5:59 PM |
| 3 | Something to keep in mind, be flexible and adapt to the situation. So many times things go wrong; do not to let it consume you. Be creative with safety as the upmost importances. | Aug 12, 2012 5:57 PM |
| 4 | I like the idea of computerized checklists for different events. More training and drills geared to different events. Ensuring review of events that occur elsewhere and lessons learned. | Aug 2, 2012 1:44 PM |
| 5 | I agree with most of the ideas already presented. I think one of the most important components is Incident Management Teams who are able to bring personnel and resources to help gain control of scene and resource management. | Jul 31, 2012 3:25 PM |
| 6 | Round table discussions with the diferent emergency agencies that will be involved in the surge incident should it occur. | Jul 30, 2012 10:39 AM |
| 7 | Re-think ICS training. I teach a class entitled "Bottom up Incident Command". Starting with the initial report and first due team starts the process of a developing incident scene. We tend to teach ICS/NIMS from the top down, beginning with Sections and Section Chief Responsibilities. We need the lowest ranking person to understand how to establish command and gain control of an incident. We also need to empower our population and train them in initial response to an incident. Israel, citizens are trained to move people out of harms way and to administer basic first aid. I have never met a police chief that uses ICS or NIMS. Public works NEVER uses NIMS. These agencies should be held accountable for learning and using the system. | Jul 30, 2012 10:28 AM |
| 8 | As Fire Chiefs and Incident Commanders I am afraid that we are fixed upon traditional training for incidents that we may be required to respond to take command and control. Our problem solving techniques ate based on our training and knowledge of these types of events. I believe that we have to educate ourselves and try learning to solve problems in non-traditional methods. I would look to industries like IT and software to see how they solve problems. | Jul 30, 2012 10:00 AM |

Page 11, Q10. As a reminder, surge events are defined as emergency incidents that that require resources well beyond normal operating capacity. Examples of surge events include: accidents involving a large number of patients; the release of significant quantities of hazardous materials; incidents involving ex...

9	Incident Management Teams and Overhead teams to assist with major incidents. All Chiefs and Incident Commanders cannot be proficient in all areas and especially in the unique situations where there is limited experience and exposure. Utilization of specialized resources including management teams early in the incident would be a tremendous benefit. Having experienced personnel assisting at the scene, that have the proper training and would work with the local IC would be a benefit.	Jul 30, 2012 9:36 AM
10	i support your idea of regional or local area command support teams similar to the national "Go Teams".	Jul 29, 2012 5:51 PM
11	Leadership skills through training but not just the fire service in other fields as well open your mind, develop problem solving skills through training and role playing, work on communication skills through role playing and drills, keeping an open mind, listen to all as much as you can, thing out of the box when you need too.	Jul 29, 2012 9:57 AM
12	Not real creative, but we continue to keep strong working relationships with the regional fire and EMS providers. We have a fluid Mutual Aid program and personnel are use to working with other departments. As such, I think that having these strong relationships will be invaluable when a large scale event does occur and the need to mobilize large numbers of resources is called upon.	Jul 27, 2012 7:11 AM
13	Read as many AAR-IP as I can, listen to audio logs of surge events whenever they become public. Look for lessons learned that can be passed along to our personnel while the incident is still fresh in people's minds.	Jul 26, 2012 10:42 AM
14	Automatic response by IMT and Incident support personnel. Automatic response by neighboring Chiefs. Response includes experience and individuals that know capabilities and resources of available responders. More regional training events.	Jul 23, 2012 1:14 PM
15	We need to develop a training program that would use todays state of the are technology to enable the IC to be able to command a changing event and creteque him on what they would need to improve on and what went good. This would train them how to effectivley react to an even that is changing rapidly. All Chief Officer should be required to recieve this trainig befor taking command. All Line officers should be required to take this course.	Jul 23, 2012 11:06 AM
16	Each municipality should train annually on a surge event for them. Then, the states should conduct such training for each region so neighboring communities work together. Semi-annual training would begin to take the mystery out of such events and with turn-over, hone the abilities of new leaders before the BIG ONE occurs.	Jul 23, 2012 6:00 AM

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Adler, Michael and Erio Ziglio. *Gazing into the Oracle: The Delphi Method and its Application to Social Policy and Public Health*. London: Jessica Kingsley Publishers, 1996.
- Bahadir, Sahin, Naim Kapucu, and Ali Unlu. "Perspectives on Crisis Management in European Union Countries: United Kingdom, Spain and Germany." *European Journal of Economic and Political Studies*, 2008: 17–39.
- Barbera, Joseph A. and Anthony G. Macintyre. *Medical and Health Incident Management (MaHIM) System: A Comprehensive Functional System Description for Mass Casualty Medical and Health Incident Management: Final Report, December 2002*. Washington, DC: Institute for Crisis, Disaster, and Risk Management, the George Washington University, 2002.
- Betts, Bradley J., Robert W. Mah, Richard Papasin, Rommel Del Mundo, Dawn M. McIntosh, and Charles Jorgensen. *Improving Situational Awareness for First Responders Via Mobile Computing*. Moffett Field, CA: National Aeronautics and Space Administration, Ames Research Center, 2005. http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20060000029_2005249624.pdf.
- Brownlee, J., et al. Complex Adaptive Systems. *Complex Intelligent Systems Laboratory, Centre for Information Technology Research, Faculty of Information Communication Technology, Swinburne University of Technology: Melbourne, Australia* (2007).
- Cai, Guoray. "Extending Distributed GIS to Support Geo-Collaborative Crisis Management." *Annals of GIS* 11, no. 1 (June 2005): 4–14.
- Cai, Guoray, Rajeev Sharma, Alan M. MacEachren, and Isaac Brewer. "Human-GIS Interaction Issues in Crisis Response." *International Journal of Risk Assessment and Management* 6, no. 4/5/6 (2006): 388–407.
- Cai, Guoray, Alan M. MacEachren, Isaac Brewer, Mike McNeese, Rajeev Sharma, and Sven Fuhrmann. "Map-Mediated GeoCollaborative Crisis Management." In *Intelligence and Security Informatics : IEEE International Conference on Intelligence and Security Informatics, May 19-20, 2005 : Proceedings*. Edited by Paul Kantor, Gheorghe Muresan, Fred Roberts, Daniel D. Zeng, Fei-Yue Want, Hsinchun Chen and Ralph C. Merkle. Lecture Notes in Computer Science ed. Vol. 3495, 65-76. Berlin; New York: Springer, 2005.

- Calderwood, Roberta, Beth W. Crandall, and Gary A. Klein. *Expert and Novice Fire Ground Command Decisions*. Yellow Springs, OH: Klein Associates, Inc., 1987.
<http://www.dtic.mil/cgibin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA234877>.
- Delbecq, André L., Van de Ven, Andrew H., and David H. Gustafson. *Group Techniques for Program Planning: A Guide to Nominal Group and Delphi Processes*. Glenview, IL: Scott, Foresman, 1975.
- Deverell, Edward. "Flexibility and Rigidity in Crisis Management and Learning at Swedish Public Organizations." *Public Management Review* 12, no. 5 (2010): 679–700.
- Diaz, Sara K. "Where do I Start? Decision-making in Complex Novel Environments." Master's Thesis, Naval Postgraduate School, Monterey, CA; 2010, URL.
http://edocs.nps.edu/npspubs/scholarly/theses/2010/Sep/10Sep_Diaz.pdf;
- Dolan, S. L. and S. Garcia. "Managing by Values: Cultural Redesign for Strategic Organizational Change at the Dawn of the Twenty-First Century." *Journal of Management Development* 21, no. 2 (2002): 101–117.
- Domres, B, Schauwecker, H. H., Rohrmann, K, Roller, G, Maier, GW, and Manger, A. "The German Approach to Emergency and Disaster Management." *National Center for Biotechnology Information*. 2000.
www.ncbi.nlm.nih.gov/pubmed/11117024.
- Dynes, Russell R. and B. E. Aguirre. "Organizational Adaptation to Crises: Mechanisms of Coordination and Structural Change." *Disasters* 3, no. 1 (March 1979): 71–74.
- Führung und Leitung im Einsatz - Führungssystem. "Leadership and Command in Emergency Operations." *DV 100*. (Dec. 20, 2007): 43.
- Gasaway, Richard B. "Making Intuitive Decisions Under Stress: Understanding Fireground Incident Command Decision-Making." *International Fire Service Journal of Leadership and Management* 1, no. 1 (2007): 8-18.
<http://www.ifsjlm.org/PastEditions.htm>.
- Gladwell, Malcolm. *Blink: The Power of Thinking without Thinking*. New York: Little, Brown and Company, 2005.

- Harrauld, John R. "Agility and Discipline: Critical Success Factors for Disaster Response." *The Annals of the American Academy of Political and Social Science* 604, no. 1 (March 2006): 256–272.
- Harrauld, John R., Joseph Barbera, Irmak Renda-Tanali, Damon Coppola, and Gregory L. Shaw. *Observing and Documenting the Inter-Organizational Response to the September 11th Attack on the Pentagon*. Washington, DC: The George Washington University Institute for Crisis, Disaster and Risk Management, 2002.
- Heiko, Paulheim, Sebastian Doweling, Karen Tso-sutter, Florian Probst and Thomas Ziegert. "Improving Usability of Integrated Emergency Response Systems: The SoKNOS Approach."
- Hintze, Neil R. "First Responder Problem Solving and Decision-making in Today's Asymmetrical Environment." Master's Thesis, Naval Postgraduate School, Monterey, CA: 2008.
- Hocevar, Susan P., Gail F. Thomas, and Erik Jansen. "Building Collaborative Capacity: an Innovative Strategy for Homeland Security Preparedness." In *Advances in Interdisciplinary Studies of Work Teams*, edited by Michael M. Beyerlein, Susan T. Beyerlein and Frances A. Kennedy. Vol. 12, 255–274: Emerald Group Publishing Limited, 2006.
- Innes, Judith Eleanor and David E. Booher. *Planning with Complexity: An Introduction to Collaborative Rationality for Public Policy*, New York, NY: Routledge, 2010.
- Interschutz. *INTERSCHUTZ - Germany's Fire Departments*. www.interschutz.de.
- Johnson, G. "Managing Strategic Change—Strategy, Culture and Action." *Long Range Planning* 25, no. 1 (1992): 28–36.
- Kiel, L. Douglas. "Chaos Theory and Disaster Response Management: Lessons for Managing Periods of Extreme Instability." In *What Disaster Response Management Can Learn from Chaos Theory*, Edited by Gus A. Koehler. Sacramento, CA: California Research Bureau, California State Library, 1995. http://www.library.ca.gov/crb/96/05/over_12.html.
- Klatt. Susanne. "Staffing and Training of the Essen Fire Department Incident Management Team." Emmitsburg, MD: Executive Fire Officer Program, United States Fire Administration, 2010.
- . *The Power of Intuition: How to Use Your Gut Feelings to Make Better Decisions at Work*. Crown Business, 2004.

- . Roberta Calderwood, and Anne Clinton-Cirocco. "Rapid Decision-making on the Fire Ground." SAGE Publications, 1986.
<http://pro.sagepub.com/content/30/6/576.short>.
- Klein, Gary A. "A Recognition-Primed Decision (RPD) Model of Rapid Decision-making." In *Decision-making in Action: Models and Methods*, edited by Gary A. Klein, 138–147. Norwood, NJ: Ablex Pub., 1993.
http://www.ise.ncsu.edu/nsf_itr/794B/papers/Klein_1989_AMMSR_RPDM.pdf.
- Klitgaard, Robert and Gregory F. Treverton. *Assessing Partnerships: New Forms of Collaboration*. Washington, DC: IBM Endowment for the The Business of Government, 2003.
<http://www.businessofgovernment.org/sites/default/files/Assessing%20Partnerships.pdf>.
- Kwan, Mei-Po and Jiyeong Lee. "Emergency Response After 9/11: The Potential of Real-Time 3D GIS for Quick Emergency Response in Micro-Spatial Environments." *Computers, Environment and Urban Systems* 29, no. 2 (2005): 93–113.
- Linstone, Harold A. and Murray Turoff. *The Delphi Method: Techniques and Applications*. Vol. 18. Reading, MA: Addison-Wesley Pub., 1976.
- Mahoney, Robert T. "Deciding Who Lives: Considered Risk Casualty Decisions in Homeland Security." Master's Thesis, Naval Postgraduate School, Monterey, CA: 2008,
http://edocs.nps.edu/npspubs/scholarly/theses/2008/Dec/08Dec_MahoneyR.pdf.
- Marcus, Leonard J., Isaac Ashkenazi, Barry Dorn, and Joseph Henderson. *The Five Dimensions of Meta-Leadership*. Cambridge, MA: National Preparedness Leadership Initiative, Harvard School of Public Health, 2007.
- McNealy, John M. "Best Practices to Develop Situational Awareness in Dynamic Small Group Military Settings." Master of Science in Library Science, University of North Carolina at Chapel Hill, 1999,
http://ils.unc.edu/MSpapers/backup_pdf/McNealyMasters.pdf.
- Meadows, Donella H. and Diana Wright. *Thinking in Systems: A Primer*, White River Junction, Vt.: Chelsea Green Pub., 2008.

- Mintzberg, Henry, Bruce W. Ahlstrand, and Joseph Lampel. *Strategy Safari: A Guided Tour through the Wilds of Strategic Management*, edited by. Translated by, edited by. New York: Free Press, 1998.
- Moynihan, Donald P. *Leveraging Collaborative Networks in Infrequent Emergency Situations*. Washington, DC: IBM Center for the Business of Government, 2005.
<http://www.businessofgovernment.org/sites/default/files/IESituations.pdf>.
- Nahmod, Abdo. "The Collaborative Capacity of the NYPD, FDNY, and EMS in New York City: A Focus on the First Line Officer." Master 's Thesis, Naval Postgraduate School, Monterey, CA 2010,
http://edocs.nps.edu/npspubs/scholarly/theses/2010/Mar/10Mar_Nahmod.pdf.
- National Fire Protection Association. *U.S. Fire Department Profile Through 2006*. Demographic Profile, National Fire Protection Association, 2006.
- O'Leary, Rosemary and Lisa B. Bingham. *A Manager's Guide to Resolving Conflicts in Collaborative Networks*. Washington, DC: IBM Center for the Business of Government, 2007.
<http://www.businessofgovernment.org/report/managers-guide-resolving-conflicts-collaborative-networks>.
- Pfeifer, Joseph W. "Network Command: The High-Tech Future of Incident Management." *WNYF* (1st, 2009): 14–18.
- . "Command Resiliency: An Adaptive Response Strategy for Complex Incidents." Master Thesis, Naval Postgraduate School, Monterey, CA 2005,
http://edocs.nps.edu/npspubs/scholarly/theses/2005/Sep/05Sep_Pfeifer.pdf.
- Quarantelli, E. L. "Disaster Crisis Management: A Summary of Research Findings." *Journal of Management Studies* 25, no. 4 (July 1988): 373–385.
- Radke, John, Tom Cova, Michael F. Sheridan, Austin Troy, Lan Mu, and Russ Johnson. *Challenges for GIS in Emergency Preparedness and Response*. Redlands, CA: Environmental Systems Research Institute, 2000.
- Renaud, Cynthia E. "Making Sense in the Edge of Chaos: A Framework for Effective Initial Response Efforts to Large-Scale Incidents." Master's Thesis, Naval Postgraduate School, Monterey, CA 2010,
http://edocs.nps.edu/npspubs/scholarly/theses/2010/Sep/10Sep_Renaud.pdf.

- Rogers, Everett. *Diffusion of Innovations*. New York, New York: Free Press, 2003.
- Sasser, Scott M., Richard C. Hunt, Bob Bailey, Jon Krohmer, Steve Cantrill, Kevin Gerold, Mark Johnson, et al. *In a Moment's Notice: Surge Capacity for Terrorist Bombings*. Atlanta, GA: Centers for Disease Control and Prevention, 2007.
<http://www.bt.cdc.gov/masscasualties/surgecapacity.asp>.
- Smith, Duane Michael. *ICS: Can it be a National Incident Management System?*. 2003 International Oil Spill Conference. Washington, DC: 2003.
http://www.iosc.org/papers_posters/IOSC%202003%20a437.pdf.
- Snowden, David J. and Mary E. Boone. "A Leader's Framework for Decision-making" *Harvard Business Review* 85, no. 11 (November 2007): 68–76.
- Stambler, Kimberly S. and Joseph A. Barbera. "Engineering the Incident Command and Multiagency Coordination Systems." *Journal of Homeland Security and Emergency Management* 8, no. 1 (August, 2011): 1–27.
- Tierney, Karen J. *Facing the Unexpected: Disaster Preparedness and Response in the United States*. Washington, DC: National Academy Press, 2001.
<http://www.nap.edu/catalog/9834.html>.
- United States Department of Homeland Security. "National Incident Management System." *Federal Emergency Management Agency*. December 2008.
Fema.gov/nims.
- U.S. Department of Commerce. National Oceanic and Atmospheric Administration. *Situation Awareness and Decision-making in a Warning Environment*. Advanced Warning Operations Course, IC Core 2, Lesson 2 Individual SA Warning Decision Training Branch. Washington, DC: National Oceanic and Atmospheric Administration, 2006.
http://www.au.af.mil/au/awc/awcgate/noaa/anti_situation_awareness.pdf.
- . *Situation Awareness and Decision-making in a Warning Environment*. Advanced Warning Operations Course, IC Core 2 Lesson 4: SA Demons: The Enemies of Situation Awareness Warning Decision Training Branch. Washington, DC: National Oceanic and Atmospheric Administration, 2006.
http://www.au.af.mil/au/awc/awcgate/noaa/anti_situation_awareness.pdf.

Weick, Karl E. and Kathleen M. Sutcliffe. *Managing the Unexpected: Resilient Performance in an Age of Uncertainty*. San Francisco, CA: Jossey-Bass Inc Pub, 2007.

———. "Mindfulness and the Quality of Organizational Attention." *Organization Science* 17, no. 4 (July/August, 2006): 514–524.

Weick, Karl E., Kathleen M. Sutcliffe, and David Obstfeld. "Organizing and the Process of Sensemaking." *Organization Science* 16, no. 4 (July/August 2005): 409–421.

Weiss, Jeff and Jonathan Hughes. "Want Collaboration? Accept-and Actively Manage-Conflict." *Harvard Business Review* 83, no. 3 (March 2005): 93–101.

Winters, Terrence J. "Mitigating Decision-Making Paralysis during Catastrophic Disasters." Master's Thesis, Naval Postgraduate School, Monterey, CA 2011,
http://edocs.nps.edu/npspubs/scholarly/theses/2011/March/11Mar_Winters.pdf.

Wise, Jeff. "What really Happened Aboard Air France 447." *Popular Mechanics* (December 6, 2011).
<http://www.popularmechanics.com/technology/aviation/crashes/what-really-happened-aboard-air-france-447-6611877>.

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California
3. Susan Hocesvar, PhD
Naval Postgraduate School
Monterey, California
4. John Rollins, JD
Center for Homeland Defense and Security
Monterey, California
5. Mayor David Narkewicz
City of Northampton
Northampton, Massachusetts
6. Stephen Coan, State Fire Marshal
Massachusetts Department of Fire Services
Stow, Massachusetts
7. Peter Ostrosky, Deputy State Fire Marshal
Massachusetts Department of Fire Services
Stow, Massachusetts
8. Edward O'Brien, Chairman
Massachusetts Fire Mobilization Committee
Holbrook, Massachusetts
9. Mr. Rob Neale, Deputy Superintendent
National Fire Academy
Emmitsburg, Maryland
10. Edmund Walker, Director
Massachusetts Firefighting Academy
Stow, Massachusetts